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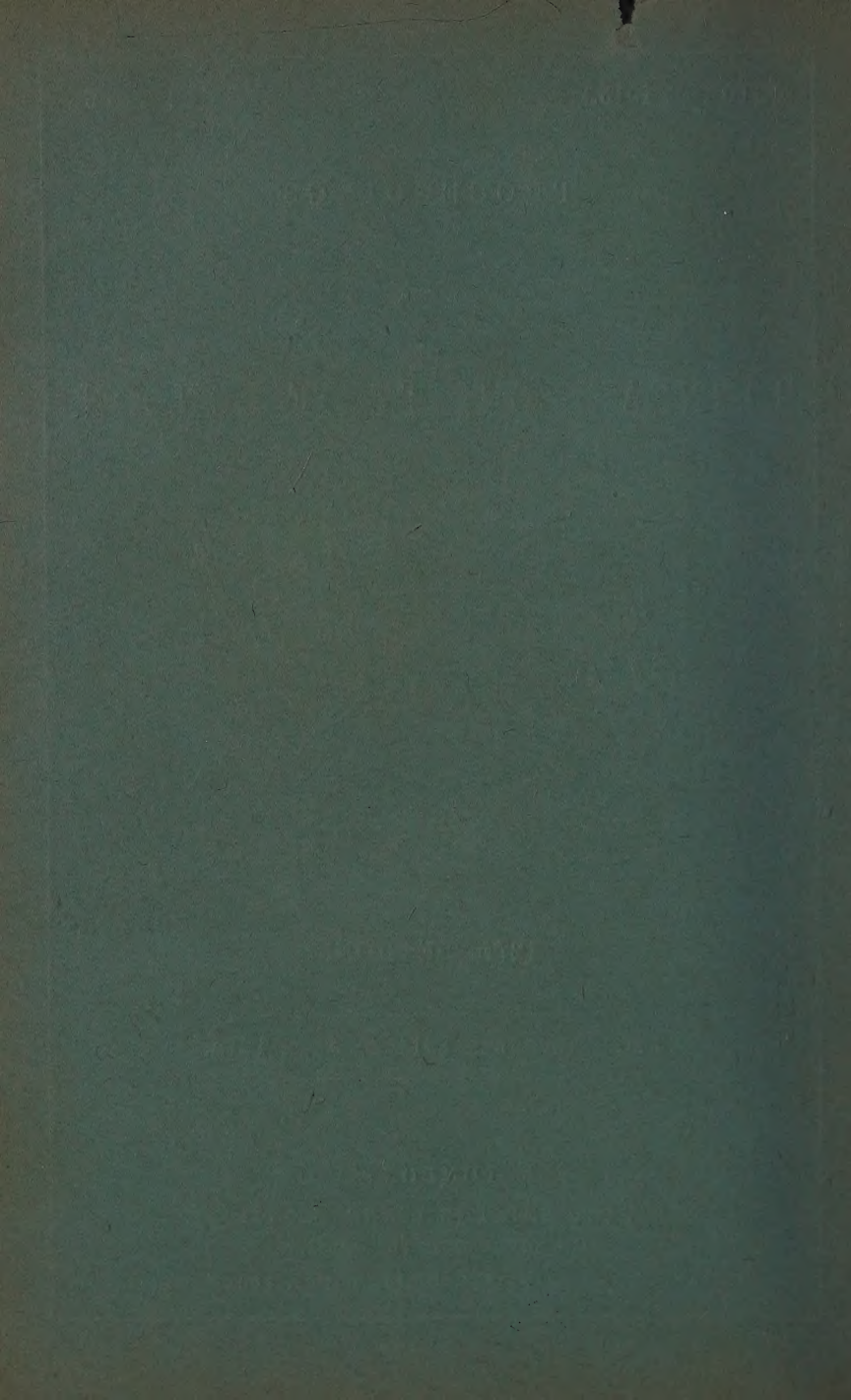
PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.



127TH SESSION.

FROM NOVEMBER 1914 TO JUNE 1915.

LONDON:
PRINTED FOR THE LINNEAN SOCIETY,
BURLINGTON HOUSE, PICCADILLY, W.,
BY TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.



To face Title.

PROC. LINN. SOC., 1914-15.



GEORGE MONTAGU

(1751—1815).

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PUBLICATIONS: SESSION JULY 1914-JULY 1915.

Journal, Botany.

Vol. XLII.	No. 287.	12/-
„ XLIII.	„ 288.	5/-

Journal, Zoology.

Vol. XXXI.	No. 209.	7/-
„ XXXII.	„ 218.	20/-
	„ 219.	8/-

Transactions, Botany.

Vol. VIII.	Part 7.	12/-
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Transactions, Zoology.

Vol. XVI.	Part 5.	3/-
„ XVII.	„ 1.	40/-

Proceedings, 126th Session, October 1914. 10/-

List of [Fellows, Associates, and Foreign Members], Nov. 1914.

PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.

(ONE HUNDRED AND TWENTY-SEVENTH SESSION,
1914-1915.)

November 5th, 1914.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 18th June, 1914, were read and confirmed.

Mrs. Edith Jane Durrant, Dr. Sarah Martha Baker, and Miss Clotilde von Wyss, were admitted Fellows.

Mr. Paul Andries van der Bijl, M.A. (Cape), Mr. William Wardlaw Thompson, F.Z.S., and Mr. Richard Cranfield Wren, were proposed as Fellows.

The following proposed alterations in the Bye-Laws, recommended by the Council, were read from the Chair:—

Chap. XIII. Sect. 1, shall be repealed, and the following substituted:—

The General or Ordinary Meetings of the Society shall be held on the afternoons or evenings of such Thursdays from November to June inclusive as the Council may decide.

Due notice of the days and hours of meeting shall be given to every Fellow whose address is known.

The following invitation was also read from the Chair :—

“BELGIAN NATURALISTS IN ENGLAND.—Any Fellow of the Linnean Society who is acquainted with any Belgian Botanist or Zoologist now in England, is requested to communicate with the General Secretary, who will submit the name to a Committee appointed by the Council for the purpose.

“The Committee are empowered to invite Belgian Botanists and Zoologists (whether Ladies or Gentlemen) to attend the Meetings of the Society, and to make use of the Library, under certain restrictions as to borrowing books. Notices of the Meetings will be sent to them during their stay in this country.”

On behalf of Mr. S. LEONARD BASTIN, a series of lantern-slides was shown by the General Secretary, illustrating Dodder attacking a plant of Red Clover, from the first groping of the shoot developed from the seed, its grip on the host, its relinquishment of its connection with the soil, and the rapid invasion and envelopment of the host-plant.

Mr. A. D. COTTON, F.L.S., explained the scope of his paper on “The Algæ, Lichens, and Fungi of the West Falkland Islands, from Mrs. Rupert Vallentin’s Collections,” illustrated with specimens, drawings, and lantern-slides. He explained that a large collection had been made by Mrs. Vallentin from 1909 to 1911, and had been presented by her to the Royal Botanic Gardens, Kew; the present paper dealt with those cryptogams mentioned in the title, the Mosses and Hepaticæ being reserved for later work.

The President having opened the Discussion, Prof. G. S. Boulger contributed a few remarks, and showed a series of views and plant-portraits made by his father-in-law, Mr. Thomas Havers, who was connected with the Falkland Islands and Fuegia in the fifties of the last century. Dr. Rendle also spoke, and Mr. Cotton briefly replied.

November 19th, 1914.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 5th November, 1914, were read and confirmed.

The following proposed alterations in the Bye-Laws, recommended by the Council, were read from the Chair for the second time :—

Chap. XIII. Sect. 1, shall be repealed, and the following substituted :—

The General or Ordinary Meetings of the Society shall be

held on the afternoons or evenings of such Thursdays from November to June inclusive as the Council may decide.

Due notice of the days and hours of meeting shall be given to every Fellow whose address is known.

The President explained that Prof. G. C. Bourne, the Zoological Secretary of the Society, had, in consequence of the war, lost his demonstrators, and therefore a much heavier share of work had fallen upon him, rendering it impossible for him to attend the evening meetings, though he hoped still to attend the Councils.

The Rev. T. R. R. STEBBING hoped that it might not be deemed inopportune if he ventured to congratulate the President on his recent receipt of the Darwin Medal of the Royal Society for his researches in heredity. These remarks were warmly applauded by the meeting, and the President briefly acknowledged his pleasure in the congratulations thus expressed.

Mr. A. J. WILMOTT, F.L.S., gave an account of the discovery of *Hydrilla verticillata*, Casp., by Mr. Pearsall, in Esthwaite Water, a small lake to the west of Windermere; illustrating it by specimens under the microscope.

Mr. James Groves and Mr. T. A. Dymes contributed further remarks, and Mr. Wilmott replied to the questions raised.

Mr. C. H. WRIGHT, A.L.S., then gave a summary of his paper, "The Mosses and Hepaticæ of West Falkland Islands, from the collections of Mrs. Elinor Vallentin." Having made a collection of phanerogams and ferns, which formed the basis of a paper published in the Journal of this Society, Botany, vol. xxxix. pp. 313-339, Mrs. Vallentin returned to the Falkland Islands and made collections of the lower Cryptogams. The present paper contains the determinations of this collection and attempts to bring together the information previously published on other collections.

The paper was illustrated by specimens and coloured drawings made by Mrs. Vallentin; and the lantern-slides exhibited were lent also by her.

Mr. H. N. DIXON and Dr. Otto Stapf, Sec.L.S., spoke on items connected with the topics raised in the paper, and the author replied.

The last paper was by Mr. R. S. BAGNALL, F.L.S., "Thysanoptera of the West Indies," which was read on behalf of the author by the General Secretary.

December 3rd, 1914.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 19th November, 1914, were read and confirmed.

Phra Vanpruk Picharn, Mr. Henry Edmund Charles Campbell Windle, and Mr. Madabusi Srinivasa Ramaswami, M.A. (Calc.), were proposed as Fellows.

Mr. Paul Andries van der Bijl, M.A. (Cape), Mr. William Wardlaw Thompson, F.Z.S., and Mr. Richard Cranfield Wren, were elected Fellows.

The following proposed alterations in the Bye-Laws, recommended by the Council, were read from the Chair for the third time, and confirmed by Ballot of the Fellows present :—

Chap. XIII. Sect. 1, shall be repealed, and the following substituted :—

The General or Ordinary Meetings of the Society shall be held on the afternoons or evenings of such Thursdays from November to June inclusive as the Council may decide.

Due notice of the days and hours of meeting shall be given to every Fellow whose address is known.

The President announced the death of Dr. Mordecai Cubitt Cooke, A.L.S.

Mr. R. C. McLEAN, B.Sc., gave an account of "An ecological journey in South America," illustrating the same by a series of lantern-slides from photographs taken by him, from Pernambuco, Rio de Janeiro, the Falkland Islands, Valparaiso, the transandean railway, and Buenos Aires.

The discussion which followed was maintained by Prof. J. B. Farmer, Dr. Rendle, the Rev. T. R. R. Stebbing, and Mr. Worsdell, the lecturer briefly replying.

Mr. CYRIL WEST, B.Sc., F.L.S., explained the main points of a paper written by him in collaboration with Mr. HISAYOSHI TAKEDA, "*On Isoëtes japonica*, A. Br."

Mr. W. C. Worsdell contributed a few additional remarks.

The President announced that the next meeting would be held on Thursday, 17th December, at Five o'clock in the afternoon.

December 17th, 1914.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 3rd December, 1914, were read and confirmed.

Mr. Edwin John Butler, M.B., was admitted a Fellow.

Mr. Richard Francis Towndrow was proposed as an Associate.

Mr. MILLER CHRISTY, F.L.S., exhibited a remarkable gall which he believed to be new in this country. It is in the nature of a "Witches'-Broom," but appears on *Salix fragilis*; whereas no "broom" of the kind has hitherto been recorded on any species of willow in this country. It appears in great abundance on all trees of the species named growing in proximity. According to Prof. Nalepa, it is due to a gall-mite *Eriophyes triradiatus*, but not improbably a parasitic fungus may assist.

So far, the gall is confined, apparently, to a limited area within a radius of, say, twelve or fifteen miles around London. Mr. Christy has seen it or had it reported to him from Walthamstow, Chingford, Romford, Dagenham, and from Eltham and other places in Kent; and he has been unable to hear of it having been seen anywhere more than three or four years ago. It is unnoticed, he believed, in any work on the plant-galls of Britain.

The gall seems to appear only on *Salix fragilis*; never on *Salix alba* var. *cœrulea*. This is fortunate, as the former is a tree of almost no economic importance, whilst the latter is of high value.

The gall is remarkable in that it appears on the female flower, which develops during summer, till it resembles a bunch of moss, of an olivaceous green colour, from two to eight inches in length, hanging from a small twig. The bunch consists of hundreds, perhaps thousands, of abnormal flowerets.

In the course of the winter, the gall or broom shrivels and becomes black, but continues to hang on the trees through the following summer, presenting a most striking appearance.

A discussion followed in which Mr. E. Step, Miss G. Lister, Mr. W. C. Worsdell, Mr. Stanley Edwards, Mr. J. C. Shenstone, Dr. Marie Stopes, and Prof. Minchin took part.

Mr. WILFRED MARK WEBB, F.L.S., described the circumstances under which the Brent Valley Bird Sanctuary came into existence. He said that twelve years ago the Brent Valley Branch of the Selborne Society took steps to protect a wood of nineteen acres in

its district, not far from Ealing, which had long been known as an abiding place for birds. The immediate object was to preserve the nightingales; and a small Committee was formed to approach the tenant of the farm on which the wood was situated with a view to the appointment of a watcher. Ultimately, the Committee appointed its own keeper, took over the wood from the farmer, and now rents it direct from the owners.

No very rare birds occur in the wood, but it is important in the neighbourhood of large towns to give to the commoner kinds an opportunity of nesting undisturbed. Forty-one species have been recorded as breeding in the wood, thirty-nine of them during recent years. Among these may be mentioned the nightingale, lesser whitethroat, the blackcap, garden warbler, chiffchaff, willow-warbler, long-tailed tit, marsh-tit, tree-creeper, hawfinch, goldfinch, redpoll, nuthatch, wryneck, cuckoo, red-backed shrike, turtle-dove, and wild duck. Including the winter migrants and occasional visitors, eighty-eight species have been observed in or close to the wood. Of these, the golden-crested wren, all the three British woodpeckers, the nightjar, the brown owl, the barn owl, the snipe, and the kingfisher are seen commonly or from time to time. Owing to the introduction of nesting-boxes, several species have increased in numbers or have been induced to nest.

Mr. Webb exhibited lantern-slides of nests, and described the experiments made with regard to the provision of nesting-sites.

Mr. Miller Christy, Mr. T. A. Dymes, Mr. A. H. Maude, Mr. C. E. Salmon, the Rev. T. R. R. Stebbing, Mr. J. C. Shennstone, and the President contributed further remarks, Mr. Webb replying.

Dr. O. STAFF, Sec.L.S., read a letter addressed by Dr. Tokutaro Ito, F.L.S., of Tokyo, to Lady Hooker, in which he informs her that Sir Joseph Dalton Hooker "has been recently selected by the contemporaries in Japan, as one of the Twenty-nine Heroes of the World that Modern Time has produced."

January 21st, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 17th December, 1914, were read and confirmed.

Mr. Richard Cranfield Wren was admitted a Fellow.

Phra Vanpruk Picharn, Mr. Madabusi Srinivasa Ramaswami, M.A. (Calc.), and Mr. Henry Edmund Charles Campbell Wintle, were elected Fellows.

Mr. James Melville Macoun, C.M.G., Corr.F.Z.S., was proposed as a Fellow.

The President announced that owing to illness, Prof. W. A. Herdman, F.R.S., had been prevented from attending to present a paper by Miss RUTH C. BAMBER, on the Fishes of the Sudan Coast, but that it was hoped the Society might have that pleasure on a later date.

Professor W. J. DAKIN, F.L.S., submitted an account of the recent Percy Sladen Trust Expedition carried out under his direction, to investigate the structure and fauna of the Abrolhos Islands.

The islands are situated 40-50 miles off the coast of West Australia. They are interesting because of the almost complete lack of knowledge concerning the marine fauna of that part of the world. In addition, however, they possess many peculiar features of their own. Although they are coral islands (the most southern in the world), the land fauna is decidedly continental and indicates a comparatively recent connection with the mainland of Australia.

The lecture, which was illustrated by a series of lantern-slides, was followed by remarks from Commander Walker (who recalled his experience on the islands, when they were visited by H.M.S. 'Penguin'), Dr. J. Murie, and Mr. H. N. Dixon, Prof. Dakin replying.

February 4th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 21st January, 1915, were read and confirmed.

Mr. Richard Francis Towndrow was elected an Associate.

Prof. HERDMAN, F.R.S., F.L.S., explained the chief points in a "Report on Fishes collected by Dr. Crossland from the Sudanese Coast of the Red Sea," by RUTH C. BAMBER, M.Sc. (Communicated by Prof. W. A. Herdman, F.R.S., F.L.S.)

The Rev. T. R. R. Stebbing, F.R.S., F.L.S., having put a question, Prof. Herdman replied.

Dr. MARIE C. STOPES, F.L.S., exhibited and described a fossil of doubtful affinity, and stated that the fossil was found *in situ* by the exhibitor in the Lower Greensand at Luccombe Chine, in a horizon in which a number of new plants as well as the famous *Bennettites Gibsonianus* have been discovered.

The specimen in transverse section of an area of 20×35 cm. shows a uniform structure of most beautifully petrified tissue, which appears to be quite unlike any known fossil. Microphotographs were exhibited showing the details of the tissues, which, in many respects, are like a giant phloem. The name *Vectia luccombensis* is proposed, and the exhibitor asked for suggestions as to its affinity.

Dr. D. H. Scott, Sec.R.S., F.L.S., and Prof. Margaret Benson, F.L.S., having spoken, the exhibitor replied.

Dr. H. DRINKWATER, F.L.S., gave a lantern-demonstration of "Brachydactyly as an example of Mendelian Inheritance." Some wax models, and a large number of photographs, radiographs, and 69 lantern-slides were exhibited. (Abstract, see p. 40.)

The Rev. T. R. R. Stebbing and Mr. W. S. Rowntree, F.L.S., contributed some additional observations, and the author replied.

February 18th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 4th February, 1915, were read and confirmed.

Mr. James Melville Macoun, C.M.G., was elected a Fellow.

The President announced that the Council had decided to hold the remaining six General Meetings of the present session at five o'clock in the afternoon.

The General Secretary read a letter from His Excellency Count Wrangel, enclosing a photograph of a memorial recently erected by the Royal Academy of Sciences, Stockholm, in the Swedish Cemetery at Woking (Brookwood), consisting of a headstone of Swedish granite, inscribed "Kungliga Vetenskapsakademien reste vårdens 1914. Daniel Solander *1733 †1782." Allusion was made to the striking portrait of Solander by John Zoffany in the possession of the Society.

A cordial vote of thanks was passed to the Swedish Minister for this very acceptable gift.

Mr. HAROLD WAGER, F.R.S., F.L.S., then gave an account of his recent researches upon "The action of Light upon Chlorophyll," illustrating his remarks with lantern-slides, many being autochromes. He stated that the chemical changes produced by light on the green leaf, sugar and starch being evolved from carbon dioxide and water, are still obscure.

By making a film of chlorophyll upon paper and on glass, by floating an alcoholic solution, and allowing it to dry, he was able to bleach a portion under strong sunlight, and covering a portion by black paper; when this was tested by Schiff's solution, the exposed, that is bleached portion, became pink, the unexposed portion showing no colour change. Another experiment was made by subjecting similarly bleached portions of chlorophyll to the action of potassium iodide, when the exposed parts turned reddish blue, in consequence of the liberation of iodine, which acts upon the starch on the paper.

It was then tried whether the solution of chlorophyll itself gave the reaction. Four test-tubes were partly filled with a solution of chlorophyll in petroleum ether and corked; two were exposed to light and two kept in the dark: reactions confirmed the previous results.

These experiments clearly show that the decomposition of chlorophyll is accompanied by the formation of an aldehyde and of something able to oxidize the potassium iodide and to set free the iodine.

If the chlorophyll papers are exposed behind coloured filters, we find that both the aldehyde and the potassium iodide reaction are much stronger in the red than in the blue, and are weakest in the green; but if the exposure behind the green and blue is prolonged to 8 or 10 times that of the red, the reaction in the blue becomes as strong as that in the red.

Instead of alcoholic extract of chlorophyll we may use dried leaves, or chlorophyll expressed from leaves, or layers of *Euglena* or algæ spread over the paper. The reactions also take place inside a leaf, if the bleaching has been efficient. Thus if sunlight is condensed by a lens upon a living leaf of *Oxalis Acetosella* containing plenty of starch, the chlorophyll is bleached in a small area, and if treated with Schiff's solution, a strong aldehyde reaction results; if tested with potassium iodide the said area becomes blue.

It having been stated that formaldehyde is produced when chlorophyll is exposed to sunlight in the presence of carbon dioxide, an attempt was made to determine whether such was the case in the present series of experiments; but the author was not able to satisfy himself on this point, though several of the tests succeeded even with so small an amount as one-millionth of formaldehyde. Hydrogen peroxide had been suggested as the gaseous oxidising compound of chlorophyll, but the result of many varied tests showed that this was not so.

Further experiments were detailed, as those on chlorophyll in *Laminaria*: that photo-decomposition of chlorophyll takes place only in the presence of oxygen; that carbon dioxide need not be present to cause photo-decomposition of chlorophyll; and the action of light upon the green and yellow pigments of chlorophyll—the yellow pigment bleached rapidly, the green much more slowly.

There is evidence to show that the reactions described in this paper are not due to the chlorophyll pigments only, but that other substances are present, associated especially with the carotin and xanthophyll upon which the activity of the chlorophyll partly depends.

Dr. S. B. Schryver (visitor), Mr. Neilson Jones, and Dr. J. P. Young contributed further remarks, and the author replied.

March 4th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 18th February, 1915, were read and confirmed.

The Rev. Thomas Albert Jefferies was proposed as a Fellow.

Prof. Maurice Caullery (Paris); Prof. Charles Henri Marie Flahault (Montpellier); and Prof. Jacques Loeb (Chicago), were proposed as Foreign Members.

The reading of a paper on the Lichens of South Lancashire, by Messrs. J. A. WHELDON, F.L.S., and W. G. TRAVIS, was postponed to the following Meeting.

Mr. A. W. HILL, M.A., F.L.S., exhibited specimens of the Cucurbitaceous genus *Marah*, with its remarkable germination. He stated that the genus *Marah* includes some eleven species practically confined to the Pacific watershed of the W. States of N. America and the islands of Lower California. The genus is distinguished from *Echinocystis* and other genera with similar floral characters by its enormous tuberous root, associated with which is the peculiar mode of germination of the seeds. The petioles are fused to form a tube, and on germination this tube grows out, carrying plumule and radicle some distance into the ground, the cotyledons remaining hypogeal. The plumule finally bursts through the petiolar tube, and grows up into the air with sharply bent over tip. The petiolar tube is covered with hairs which appear to function as root-hairs. In *M. fabaceus* the tube is very short, but in the other species examined, including the classic case of *Megarhiza californica* (probably *Marah macrocarpus*), described by Asa Gray and Charles Darwin, the petiolar tube may be as much as 6 inches long. In *M. horridus*, the seeds of which species were sent to Kew by Mr. F. R. S. Balfour, of Dawyck, the petiolar tube not only splits into two halves but the petioles further split into three strands, each containing a vascular bundle, and each

strand appears to be responsible for the building up of a definite portion of the tuber.

Prof. A. C. Seward, Mr. W. C. Worsdell, and Dr. A. B. Rendle contributed further remarks, the author replying.

Dr. MARIE C. STOPES, F.L.S., gave an exposition of "New type of Stem-anatomy in *Cycadeoidea*, with a well-petrified new species." The exhibitor gave a short account of two species of *Cycadeoidea* in which the internal anatomy is partially preserved, and also of a well-petrified new species showing very curiously alternating series of wood zones. The specimens are interesting, not only as new petrifications, but for their bearing on the essential differences between *Cycadeoidea* and *Bennettites*.

Dr. D. H. Scott and Prof. A. C. Seward commented on the interest of this exhibition, and the author replied.

Prof. E. A. MINCHIN gave the salient points of a paper by Mr. WALTER E. COLLINGE, M.Sc., F.L.S., descriptive of a new genus and species of terrestrial Isopoda from British Guiana, forwarded to the author by Mr. G. E. Bodkin, Government Economic Biologist at Georgetown, Demerara.

Dr. STAFF exhibited inflorescences of the Carob tree (*Ceratonia Siliqua*) representing the several sexual conditions in which the tree occurs. He also gave an account of Cavanilles's observations in the Carob groves of Valencia and the work done by Heckel and Schlagdenhauffen on the French Riviera, and by Gennadius in Cyprus. According to these authors most of the apparently female trees, that is trees with very small sessile anthers, are in reality hermaphrodite (brachystemonous hermaphrodites in contradistinction to the rare dolichostemonous hermaphrodites). But Dr. Staff pointed out that no anthers containing pollen could be found in the "brachystemonous" specimens in the Kew Herbarium, in spirit material recently received from the Italian Riviera, and in preparations of such flowers obtained from Cyprus. In spite of Heckel's, Schlagdenhauffen's, and Gennadius's excellent work, there is still some mystery surrounding the pollination of the Carob tree which is certainly worth studying on the spot.

Mr. W. C. Worsdell, Dr. A. B. Rendle, and Mr. A. W. Hill discussed certain of the problems raised.

March 18th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 4th March, 1915, were read and confirmed.

The Rev. John Robert Lewis Kingon, M.A., was admitted a Fellow.

Mr. Sidney Edwards Pougnet was proposed as a Fellow.

The Treasurer showed two recently acquired volumes, purchased for the Library from the income derived from the bequest of the late Mr. Francis Tagart, and remarked upon the great usefulness of the Fund thus set apart.

The Botanical Secretary briefly epitomised a paper by Messrs. J. A. WHELDON, F.L.S., and W. G. TRAVIS, on "The Lichens of South Lancashire."

The President commented on the corresponding changes in the insect fauna, due to the same causes as those affecting the lichens.

Mr. E. J. BEDFORD exhibited a series of exquisite drawings in water-colour of 36 British Orchids, and lantern-slides and photographs of the same plants in their natural surroundings.

A discussion followed, and Dr. A. B. Rendle, Dr. C. E. Moss, Mr. F. N. Williams, and Mr. R. A. Rolfe took part, the exhibitor briefly replying.

Dr. A. B. RENDLE exhibited some specimens collected during the recent visit of the British Association to Australia. These included:—(1) A specimen of the so-called "blackfellow's bread" (*Polyporus Mylittæ*), the sclerotium or resting condition of a fungus which is found in some places in considerable quantity buried in the soil. The fructification, which is very rare and was unknown until 1892, shows it to be a *Polyporus*. When fresh the sclerotium is of a cheesy consistency and was used as food by the aborigines, when dry it becomes very hard and horny; examination shows that it can be of but little nutritive value as it consists mainly of a fungus-cellulose.

(2) A fine spike of *Xanthorrhœa quadrangulata* from Mt. Lofty near Adelaide, one of the "black-boys" or "grass-trees" which are a characteristic feature of Australian vegetation. It was pointed out that the inflorescence is a "compass-plant," as the flowers open first on the north side, that being the more exposed to the sun at the antipodes. A photograph of another species, *X. Tateana*, from Kangaroo Island, showed a specimen over 24 feet high without the spike, which as a rule is at least equal in length to the stem.

(3) A climbing species of *Drosera* (*D. Planchonii*) also from Mt. Lofty, showing the method of growth from an underground bulb, and the use of some of the leaf-tentacles as attaching organs enabling the plant to climb.

(4) A portion of a plant of *Acrotricha fasciculiflora* from the

same locality, a member of one of the most characteristic Australian families, Epacridaceæ, including the heath-like plants. This species is interesting from producing a dense mass of flowers on the old wood just above the root, which are replaced later by a succulent fruit.

(5) From the outer harbour, Adelaide, a specimen of the Alga *Codium mamillosum*, in which the green colour had been fixed by a preservative solution; and a specimen of a ball of fibre formed from the decayed leaf-tissue of *Poseidonia australis*. These balls often reach a diameter of several feet and repeat on a much larger scale the phenomena associated with the northern species, *P. Caulini*, on the Mediterranean coasts.

(6) Specimens illustrating the remarkable diversity of leaf-form in *Parsonia heterophylla*, a climbing plant belonging to the family Apocynaceæ, which is common in the forests throughout New Zealand.

Miss CARLOTTA HERRING BROWNE exhibited lantern-slides of a letter from John Bartram (1699-1771), a pioneer of American botany, to Linnæus, one of five possessed by the Linnean Society, and also remarked upon the trees planted by this early investigator, which are still existing in Bartram Park in Philadelphia.

Mr. W. C. WORSDELL, F.L.S., showed a fruit displaying the characters of three species of *Citrus*. The Rev. T. R. R. STEBBING spoke of the variation in the number of the sections of the orange, between seven and fourteen, and asked whether the limit in either case was recorded as being exceeded.

April 15th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 18th March, 1915, were read and confirmed.

Mr. Chinnakavanam Tadulingam was proposed as a Fellow.

The Rev. Thomas Albert Jefferies was elected a Fellow.

The following were nominated as Auditors for the Treasurer's Accounts to the 30th April, and by show of hands were elected:—

For the Council: Sir FRANK CRISP, Bart., and Mr. JAMES GROVES.

For the Fellows: Mr. HAMILTON DRUCE and Miss ETHEL SARGANT.

Mr. C. F. M. SWYNNERTON, F.L.S., then gave an account of his paper "Experiments and Observations on the Interpretation of Form and Coloration in Plants and Animals," which was illustrated by specimens and lantern-slides.

The President remarked that the paper offered numerous points for discussion, which was prevented by the lateness of the hour.

May 6th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 15th April, 1915, were read and confirmed.

Mr. Arthur Edward Goodman and Miss Harriet May Robinson were proposed as Fellows.

Mr. Sidney Edwards Pognet was elected a Fellow.

Professors Maurice Caullery (Paris), Charles Henri Marie Flahault (Montpellier), and Jacques Loeb (Chicago) were elected Foreign Members.

Mr. W. PERCIVAL WESTELL, F.L.S., read a paper "Some Bird Problems," derived from thirty years' observation of British inland birds. The author discussed anomalies of habit and structure in the order of the list recently issued by the British Ornithologists' Union, and asked for help in attempting to clear up some of the facts narrated.

Dr. Murie, Mr. W. C. Worsdell, and the President added some remarks.

Dr. SARAH M. BAKER, F.L.S., and Miss MAUDE H. BOHLING, B.Sc., contributed a paper, "On the Brown Seaweeds of the Salt Marsh.—II. On their Classification, Morphology, and Ecology."

Mr. H. N. DIXON, M.A., F.L.S., followed with "On a Collection of Borneo Mosses made by the Rev. C. H. Binstead," from the coast region, and both author and collector regretted that so small a proportion of the rich moss-flora from the slopes of Mount Kinabalu had been gathered by anyone. The author pointed out curious facts in the distribution of some mosses, and the consequent suppression of certain recent names of so-called

geographical species, now found to be more widely spread than was formerly realised.

The Rev. T. R. R. STEBBING, F.R.S., F.L.S., exhibited photographs and drawings.

Photographs (by Mr. Joseph Chamberlain of Tunbridge Wells) of a much contorted tree, growing in the grounds of Oakhurst, Mount Ephraim, the residence of Mr. Thomas Jones-Gibb Duncanson, F.Z.S.

Stem 5 feet 6 inches high to the bulge of a supposed graft, there swelling from a girth of 2 feet $2\frac{1}{2}$ inches to 4 feet $1\frac{1}{2}$ inches.

Dr. Robert Plot, in the 'Natural History of Oxfordshire,' chap. 6, p. 174, alluded to by Loudon, says :—

"In *Willows*, and some other of the softer Woods, the uppermost Boughs are commonly *fasciated*, but the best of the kind I ever yet saw, was the Top-branch of an *Ash*, which I met with at *Bisseter*, not only *fasciated*, but most uniformly wreathed two or three times round."

May 29th, 1915.

Anniversary Meeting.

MR. HORACE W. MONCKTON, Treasurer & Vice-President,
in the Chair.

The Minutes of the General Meeting of the 6th May, 1915, were read and confirmed.

The Vice-President in the Chair then alluded to the President's absence, and moved the following Address, which was unanimously adopted, the Fellows present rising in their places :—

"The Fellows of the Linnean Society in Anniversary Meeting assembled, desire to express their profound sympathy with the President and his family in the terrible bereavement sustained by them in the death of Lieutenant RONALD WILLIAM POULTON PALMER, who had lost his life in Flanders while fighting for his country."

Colonel Masters John Godfery, Miss Lilian Lyle, and Mr. Frederick George Spring, were proposed as Fellows.

The Treasurer laid his Annual Statement of Accounts before the Meeting, and explained the items of Receipts and Payments; the same was received and adopted. (See pp. 18-20.)

The General Secretary then laid his Annual Report before the Meeting, as follows :—

Since the last Anniversary 16 Fellows have died, or their deaths been ascertained :—

Prof. Richard John Anderson, M.D.	Arthur Roope Hunt, M.A.
Alexander Craig-Christie.	Rev. Charles Henry Middleton- Wake, M.A.
Lt.-Col. David Douglas Cun- ningham, F.R.S.	Michael Murphy.
Robert Drane.	James William Oliver.
William Hancock.	William Ransom, J.P.
Edmund William Hunt Holds- worth.	Samuel Saywell, M.A.
Eardley Wilmot Blomfield Holt.	Sir John Benjamin Stone, Kt.
	John Tanner, M.D.
	William John Treutler, M.D.

Foreign Members (2).

Prof. Ambrosius Arnold Willem Hubrecht.
Prof. August Friedrich Leopold Weismann.

Associate (1).

Mordecai Cubitt Cooke, M.A., LL.D.

Fellows withdrawn (11).

Arthur William Garrard Bag- shawe, M.B.	Prof. Robert John Harvey- Gibson, M.A.
Edward Russell Burdon, M.A.	Arthur Rashdall Hammond.
Sir James McCrone Douie, K.C.S.I.	James Masson Hector, B.Sc.
George Claridge Druce, M.A.	George Edward Masee.
Sidney Guest.	Richard Frank Rand, M.D.
	Freeman Roper.

Fellows whose names were removed from the List,
by order of the Council (11).

Dhirendra Lal Day, M.A., B.Sc.	James Bryant Sowerby.
Charles Frost.	Rev. Henry Thomas Spufford.
George William Howes.	Henry Herbert Travers.
Hugh Fraser Macmillan.	James Turner.
Arthur Edward Peck.	Pridham Henry Pridham
John Stewart Remington.	Wippell, J.P.

20 Fellows have been elected, of whom 16 have qualified up to the present ; also 3 Foreign Members and 1 Associate.

Mr. T. A. DYMES enquired concerning certain Fellows withdrawing, and was replied to by the General Secretary.

The Librarian's Report was submitted as follows:—

During the year there have been received as donations from private individuals and the editors and proprietors of independent journals, 95 volumes and 184 pamphlets and parts.

From the various Universities, Academies, and Scientific Societies, with which the Society is in correspondence, there have been received in exchange, 190 volumes and 133 detached parts.

The Council, at the recommendation of the Library Committee, have sanctioned the purchase of 155 volumes and 95 parts of important works.

During the year the Library also received by donation from Mr. THOMAS HENRY RICHES, F.Z.S., 509 volumes, among them being many welcome additions, which had belonged to the late Dr. ALFRED RUSSEL WALLACE, O.M., F.R.S., F.L.S.

The total additions to the Library are therefore 949 volumes and 412 pamphlets and separate parts.

The number of books bound during the year was 615, of which 3 were in whole morocco, 369 in half-morocco, 25 in buckram, 214 in cloth, and 4 re-labelled.

New shelving for the accommodation of the books presented by Mr. RICHES has been provided in the Residence at the expense of Sir FRANK CRISP, Bart.

The General Secretary having read the Bye-Laws governing the elections, the Vice-President in the Chair opened the business of the day, and the Fellows present proceeded to vote for the Council and Officers.

The Ballot for the Council having been closed, the Vice-President in the Chair appointed Mr. L. A. Boodle, Mr. F. N. Williams, and Mr. T. A. Dymes, Scrutineers; these having examined the Ballot-papers and cast up the Votes, reported to the Vice-President in the Chair, who declared the result as follows:—

Mrs. AGNES ARBER, D.Sc.; RICHARD ASSHETON, F.R.S.; Dr. W. T. CALMAN; A. D. COTTON, Esq.; Sir FRANK CRISP, Bart.; JAMES GROVES, Esq.; Prof. D. T. GWYNNE-VAUGHAN, M.A.; Prof. W. A. HERDMAN, F.R.S.; Dr. B. DAYDON JACKSON; Miss G. LISTER; Prof. E. A. MINCHIN, F.R.S.; HORACE W. MONCKTON, F.G.S.; Dr. C. E. MOSS; Prof. E. B. POULTON, F.R.S.; Dr. A. B. RENDLE, F.R.S.; HUGH SCOTT, M.A.; Prof. A. C. SEWARD, F.R.S.; Dr. A. E. SHIPLEY, F.R.S.; Dr. OTTO STAFF, F.R.S.; Comr. J. J. WALKER, R.N.

The Ballot for the Officers having been closed, the Vice-President in the Chair appointed the same Scrutineers, and these having

TREASURER'S ACCOUNTS FOR THE YEAR ENDED APRIL 30TH, 1915.
(Presented at the Anniversary Meeting, May 29th, 1915.)

Receipts and Payments of the Linnean Society from May 1st, 1914, to April 30th 1915.

General Account.

<i>Receipts.</i>		<i>Payments.</i>	
	£ s. d.		£ s. d.
Balance at Bankers on 1st May, 1914.....	529 11 1	Taxes and Insurance	14 17 10
Interest on Investments	243 7 11	Repairs and Furniture	219 3 9
Admission Fees	120 0 0	Coal, Electric Current, and Gas	55 13 1
Annual Contributions	1554 0 0	Salaries	818 12 6
Compositions.....		Library:—	
		Books	£190 6 3
		Binding.....	150 3 11
Sales of Publications:—			340 10 2
Transactions	£160 12 4	Expenses of Publications:—	
Journals	129 9 1	Printing	£894 10 2
Proceedings and Catalogues	6 4 5	Illustrations	365 12 10
	296 5 10	Distribution	68 1 7
			1323 4 7
Fellows' postal account deposits	6 8 0	Miscellaneous Printing and Stationery	118 6 8
Donations in aid of Publications	320 0 0	Petty Expenses (including Tea and Postage)	£80 14 3
Miscellaneous Receipts	37 18 11	Fellows' postal account	6 9 11
			87 4 2
		Linnean Medal	15 0 0
		Investment of Compositions	18 19 3
		Balance at Bankers, 30th April, 1915	
		(including £63 12 8, deposits, Fellows'	
		postal account)	£88 17 8
		Cash in hand	2 2 1
			90 19 9
			<u>£3107 11 9</u>

*Investments on April 30th, 1915.**General Account.*

£	s.	d.	
1150	0	0	Metropolitan Consolidated 3½ per cent. Stock.
42	1	5	Great Indian Peninsula Railway, Annuity Class B.
450	0	0	Forth Bridge Railway 4 per cent. Stock.
1000	0	0	Metropolitan Consolidated 3 per cent. Stock.
1290	0	0	India 3 per cent. Stock.
1000	0	0	Eastern Bengal Railway 4 per cent. Debenture Stock.
1000	0	0	Great Western Railway 4 per cent. Debenture Stock.
300	0	0	Midland Railway 2½ per cent. Preference Stock.

Separate Account.

£	s.	d.	
232	5	0	Metropolitan Water Board 3 per cent. "B" Stock (Westwood Fund).
393	3	5	Ditto (Hooker Lecture Fund).
100	0	0	New South Wales 3½ per cent. Stock (Trail Award Fund).
252	18	0	2½ per cent. Consolidated Stock (Crisp Award Fund).
530	0	0	East Indian Railway 3½ per cent. Debenture Stock (Tagart Fund).

HORACE W. MONCKTON, *Treasurer.*

We have (in conjunction with the Professional Auditor, who certifies as to all details) audited the Accounts of the Society for the year ended 30th April, 1915, and found them correct. We have verified the Investments and Bank Balances.

Dated this 13th May, 1915.

W. B. KEEN, *Chartered Accountant.*

ETHEL SARGANT,
 JAMES GROVES,
 FRANK CRISP,
 O. STAFF,
 } *Auditors.*

examined the Ballot-papers and cast up the Votes, reported to the Vice-President in the Chair, who declared the result as follows:—

President: Prof. E. B. POULTON, F.R.S.

Treasurer: HORACE W. MONCKTON, F.G.S.

Secretaries: Dr. B. DAYDON JACKSON.

Dr. OTTO STAFF, F.R.S.

Prof. E. A. MINCHIN, F.R.S.

The Rev. T. R. R. STEBBING, F.R.S., exhibited and commented upon some pen-and-ink drawings of *Jasus lalandii* by Dr. J. D. F. Gilchrist, in illustration of the larval stages of that crustacean.

A short discussion followed, concerning the best methods of illustration.

The Vice-President in the Chair then addressed Dr. LEONARD DONCASTER, F.R.S., and said:—

I have great pleasure in presenting to you on behalf of the Linnean Society, the second TRAIL AWARD, generously founded by Professor TRAIL, with the object of encouraging study that throws light on the substance known as PROTOPLASM, or on what may in the progress of knowledge be regarded in a corresponding way as the physical basis of life.

Your work during the period covered by this Award—that is, during the past five years—has resulted in most valuable contributions towards the elucidation of one of the most fundamental problems presented by the study of living things, namely, the manner in which the characteristics of parents or progenitors are inherited by, and transmitted to, the offspring or descendants,—a problem which you have studied in special relation to the minute cytological structure, development and mechanism of the germ-cells.

Following this line of investigation with great industry and acumen, you have published, on the one hand, masterly observations upon the gametogenesis of various types of insects, in the course of which you have made known many new facts of great interest, especially with regard to the behaviour of the chromosomes; and, on the other hand, your experiments have brought to light many new and remarkable phenomena in heredity and genetics, especially with reference to sex-limited inheritance and sex-determination.

As an example of such investigations I need only refer to your classical researches upon the Magpie-Moth, *Abraxas grossulariata*, in which you discovered and studied a most remarkable case of sex-limited inheritance with heterozygous females.

Combining the results of laborious and detailed microscopical

observations with those of carefully planned and exact experiments, you have made great advances in correlating the phenomena of heredity with their underlying physical factors in the germ-cells, and in this way you have contributed greatly to our knowledge of the properties and activities of the living substance.

In addition to your special investigations on these questions you have published valuable general treatises on Heredity and Sex-determination.

I now present to you the Trail Award in recognition of your important contributions to the study of the living substance of organisms.

The recipient made a suitable acknowledgment.

The Vice-President in the Chair then addressed Sir GEORGE REID, G.C.M.G., the High Commissioner for Australia, and handed the Linnean Medal to him for transmission to Mr. JOSEPH HENRY MAIDEN. He said:—

Sir George Reid; It gives me sincere pleasure to ask you on behalf of the President to receive and transmit to Mr. JOSEPH HENRY MAIDEN of Sydney, New South Wales, the Medal of the Linnean Society, which the Council has thought fit to bestow on him. The pleasure is all the greater as it goes for the first time to one of our great dominions over sea. Mr. Maiden was born in this city, but he has by his life-work identified himself with the scientific aspirations of the Commonwealth of Australia. He has for more than thirty years taken a very prominent share in the study of the Australian Flora and the development of applied botany in that country. The number of papers which the publications of this Society and of the Department of Agriculture of New South Wales owe to his zeal and ability is as considerable as they are excellent. To them must be added his independent publications, which by their titles indicate the trend of the work that has placed him in the forefront of Australian botanists. There are 'The Useful Native Plants of Australia'; 'Wattles and Wattlebark,' a most valuable work on the genus *Acacia*; 'A Manual of the Grasses of New South Wales'; 'A Forest Flora of New South Wales'; 'A Critical Review of the Genus *Eucalyptus*'—this still in process of publication—and others.

The knowledge and experience which are laid down in those publications, and have thereby become the invaluable property of the country he serves, and not less so of the Empire and ultimately of Science generally, have arisen out of his devotion to his public duties as Government Botanist for New South Wales, as Consulting Botanist of the Department of Agriculture and Forestry of New South Wales and Director of the Botanic Garden at Sydney, and matured in the light of his scientific conceptions. As the official positions he holds testify to the trust which his Government puts in him, so the fact of his having served as

President of the Linnean Society of New South Wales and the Royal Society of New South Wales is proof of the high esteem he enjoys among his scientific colleagues.

Will you, Sir George, when transmitting to him the medal, also be good enough to assure him of the most cordial wishes of the Fellows who are assembled here at this anniversary meeting, and are glad to have been associated with him for so many years in the common bonds of this Society.

Sir George Reid acknowledged his gratification in thus acting on behalf of the recipient.

The General Secretary then laid the obituary notices of deceased Fellows before the Meeting, and the proceedings terminated.

OBITUARY NOTICES.

RICHARD JOHN ANDERSON, M.A., M.D., at the time of his death, on the 24th July, 1914, from an attack of pneumonia, was Professor of Natural History, Geology, and Mineralogy in University College, Galway. He was the second son of his parents, Robert Anderson and Elizabeth, born Harcourt, and was born on the 29th July, 1848, at Ballybot, Newry, thus being five days short of completing his 66th year when he died. He passed in succession through the Newry School, Queen's College and Hospital in Belfast, and then further studied in Leipzig, London, Paris, Heidelberg, and Naples, and after minor appointments became Professor in Queen's College, Galway, in 1883. He led a busy life in academic circles, congresses and meetings, and published over 300 papers on items of natural history. He joined this Society on the 18th June, 1885. [B. D. J.]

MORDECAI CUBITT COOKE.—By the death of Mordecai Cubitt Cooke, M.C., M.A., LL.D., on November the 12th, 1914, the Linnean Society lost one of its oldest and most prominent Associates, whose name it also counted among the small number of the recipients of its gold medal. M. C. Cooke was born at Horning, Norfolk, on July the 12th, 1825, as the son of a village shopkeeper. His early education seems to have been anything but methodical. He passed in turn through the hands of a lady teacher, a nonconformist minister, and a pedagogue who combined the profession of a land-surveyor with that of a schoolmaster, and trained his pupil on the same basis. Not less varied was his early start in practical life. Apprenticeship to a drapery establishment at Norwich when fifteen years of age, copying in a solicitor's office, attempts at literary productions, lecturing on poetry and teaching, led to a more settled activity as a master at the new Trinity School at Lambeth (1850–1860). During the ten years he held this post he formed a museum of economic products and lectured on economic botany. This included the

study of Indian foodstuffs; and on the termination of his connection with Trinity School the special qualification thus acquired brought him his engagement as compiler of the catalogue of the Indian exhibits at the International Exhibition of 1862, and finally his attachment to the Indian Museum, where he remained until its abolition in 1880. Simultaneously with the passing of the economic collections of the Indian Museum to the Royal Botanic Gardens, Kew, Cooke's services were transferred to that establishment, with which he remained connected until 1892, having charge of the Thallophytes in the Herbarium, and reporting on plant-diseases caused by fungi. But his activity ceased by no means with his retirement, and in fact continued until a few years before his death.

M. C. Cooke's literary work covered a large field and was unusually voluminous; but his real domain was mycology. Here his name will be remembered long after most of his other writings have been forgotten. An intimate knowledge of fungi in the field and in the herbarium, a facile pen and a skilled pencil and brush, combined with great industry and much method and consistency, are the strong assets of his publications, a certain narrowness and obstinate conservatism—so often the legacy of self-tuition—constitute their weakness. It is not the place here to enter into the details of his career and merits as a prominent mycologist, the less so as Mr. Ramsbottom has given a very full and appreciative account of that aspect of Cooke's life in his biographical sketches in the 'Journal of Botany' for February of the present year and in the 'Transactions of the British Mycological Society,' vol. v. part 1, p. 169. At any rate his work found sympathetic recognition in this country by his election as an Associate of the Linnean Society in 1877 and the award of the Linnean Medal in 1903. He was also made V.M.H. in 1902, whilst the American universities of St. Lawrence, Yale, and New York honoured him early by conferring on him the degrees, the first two of M.A. and the third of LL.D. respectively. [O. S.]

DAVID DOUGLAS CUNNINGHAM, a Fellow of the Linnean Society since 1876, died at his residence in Torquay on 31st December, 1914. The son of a minister who left the Church of Scotland at the Disruption, Cunningham was born at Prestonpans on 29th September, 1843. Entering the Medical Faculty of the University of Edinburgh at the age of twenty, he graduated with honours in medicine in 1867, and next year joined the Indian Medical Service, passing out of Netley first on the list in autumn, 1868.

At this time much attention was being given by pathologists to the theories as to the causation of cholera advanced by Hallier and De Bary, and the Secretaries of State for India and for War resolved to send to Germany the two officers who should take the highest places when leaving Netley in the Indian and the Army Medical Services respectively, to learn from these authors the details of their theories. In order that he might master the

technique employed by the Rev. M. J. Berkeley, F.R.S., in his mycological studies, Cunningham, before proceeding abroad, spent some time with Berkeley at Sibbertoft. When he reached Germany, Cunningham, after his visits to the laboratories of Hallier and De Bary, proceeded to Munich, where he worked for a time with Pettenkofer.

On his return from Germany Cunningham left for India, where he landed in 1869, and was at once attached for special duty to the department of the Sanitary Commissioner, as was his companion in Germany, the late Dr. T. R. Lewis. During the next eleven years the two officers were engaged, partly in collaboration and partly independently, in a series of pathological studies of great interest and value. In the cold weather of 1879-80 the Sanitary Department was merged in that of the Surgeon-General with the Government of India. Cunningham was appointed Professor of Physiology in the Medical College of Bengal, while Lewis became secretary to the Surgeon-General in his capacity of Sanitary Commissioner. In 1883, however, Lewis was recalled to England as assistant-professor of pathology in the Army Medical School at Netley, and from this date onwards Cunningham was entrusted with the duties which had fallen to Lewis, in addition to those of his Chair in the Medical College. How well these duties were performed, and how valuable were his contributions to pathology, may be gathered from the circumstance that he was on this account elected into the Royal Society in 1889.

This pathological work was carried on at Calcutta under trying conditions, with the result that what had been a vigorous constitution became seriously undermined. In 1897 Cunningham's health gave way; he was invalided to England and was not allowed to return to the tropics. After his retirement Cunningham settled in Torquay where, in indifferent health, he devoted the rest of his life to his garden and his books.

As to Cunningham's pathological studies, this is not the place to say more than to remark that they had in all cases a physiological basis. He recognised no line of demarcation between physiology and pathology or between animal and vegetable physiology and pathology. The title of a paper on certain effects of starvation on vegetable and animal tissues, published in the 'Quarterly Journal of Microscopical Science' in 1878, reveals the breadth of his outlook. His contributions to subjects in which members of the Society may be more particularly interested, illustrate the same catholicity of interest. Occasionally these were the by-products of purely official studies, as in the case of his papers on snake-poison, the earliest of which appeared in 1869; to this subject he returned near the close of his Indian career. As a rule, however, they were rather the relaxations of an active mind, and were either questions which attracted his attention as a teacher of physiology or subjects his interest in which was the outcome of his early friendship with Berkeley and De Bary. To the former cause may be attributed his account of

the phenomena of gaseous evolution from the flowers of *Ottelia*, published in 1887; of the phenomena of fertilization in *Ficus Roxburghii*, published in 1888; of the phenomena of propagation of movement in *Mimosa pudica*, published in 1889; and of the causes of fluctuation in turgescence in the motor organs of leaves, published in 1895 (an earlier paper on this subject had appeared in 1882). To the latter cause we may attribute his papers on the part played by a parasitic alga in the formation of certain lichens and on the occurrence of conidial fructifications in the *Mucorini*, which were published in the Society's Transactions in 1877 and 1878; also those on a new genus of *Ustilagineæ* and on an endophytic alga in the leaves of *Limnanthemum indicum*, which appeared in 1888; on the life-history of *Ravenelia*, in 1889; on a new and parasitic *Choanephora*, in 1895; and on certain diseases of fungal and algal origin affecting Indian economic plants, in 1897.

The papers alluded to contain but a small proportion of the observations made by Cunningham on subjects outside the immediate scope of his official duties during his Indian service. Throughout his exile in the East he kept a careful series of notebooks relating to all branches of natural history, and some of the contents of these have been given to the world with singular charm by Cunningham himself in two delightful volumes published by Mr. Murray—'Some Indian Friends and Acquaintances,' which appeared in 1903, and 'The Plagues and Pleasures of Life in Bengal,' which was issued in 1907.

In India, Cunningham took an active part in the performance of those unofficial duties which are allotted to men of his class. He was long a member of the Council of the Asiatic Society of Bengal and a trustee of the Indian Museum. His chief public service was, however, in connection with the renowned Zoological Garden of Calcutta, first as secretary and latterly as president of the committee of management. This service is commemorated by a bronze medallion portrait presented to the Garden by his friends when Cunningham retired. While in India he was a Corresponding Member, on his return to England he became a Fellow, of the Zoological Society of London.

The value of his public services was recognized by his being appointed an Honorary Surgeon to the Viceroy and being created a Companion of the Order of the Indian Empire. After his retirement he was made an Honorary Physician to the King. [D. P.]

ROBERT DRANE was a native of Norfolk, the eldest surviving son of Robert and Frances Drane, of Guestwick, and was born on the 21st August, 1833. After serving with Messrs. Allen & Hanbury, of Plough Court, London, he migrated to Cardiff in 1864, and eventually set up in business on his own account, which he conducted to the time of his death, nearly half a century later.

He was one of the founders and a past president of the Cardiff Naturalists' Society, founded in 1867, and he had a large share

in establishing the Cardiff Municipal Museum, and gave generously towards it; he was also a governor of the Welsh National Museum. He is credited with the addition of two species to the list of British birds—the Rusty Grackle, *Scolecophagus ferrugineus*, and Pallas's Great Grey Shrike, *Lanius major* (cf. Proc. Zool. Soc. 1881, p. 968); also a new species of Vole, known since as Drane's Vole or the Skomer Bank-Mouse, *Evotomys skomerensis*, Barrett-Hamilton, described in Proc. R. Irish Acad. 1903, p. 316.

Besides his devotion to local zoology, he was known as an adept in porcelain, and his knowledge was constantly invoked by collectors in a wide circle. He died on the 14th July, 1914, at the age of nearly 82; he became a Fellow of our Society on the 21st December, 1876. [B. D. J.]

EDWARD WILLIAM HUNT HOLDSWORTH, who died recently at Dartmouth, aged eighty-six, became a Fellow of the Linnean Society in 1856. His zoological interests were wide, but were centred chiefly in marine zoology and especially fisheries, a subject on which he was an authority of repute. He was for some years connected with the management of the Zoological Society's Gardens in Regent's Park, and contributed several papers on marine zoology to the Zoological Society's Proceedings, dealing chiefly with actinians and other cœlenterates, and in 1860 he published a handbook to the Fish House in the Zoological Gardens. Later he acted as secretary to the Royal Commission, of which Huxley was a member, and which, between 1863 and 1865, travelled round the British coasts in order to enquire into the conditions of British Fisheries. Subsequently he went to Ceylon in order to conduct an official enquiry into the pearl-fisheries. In addition to investigations on the marine fauna of Ceylon, he published two memoirs on the birds of that island. In 1874 he published an important and well-known work on 'Deep-Sea Fishing and Fishing Boats,' an account of the practical working of the various fisheries around the British Islands, with illustrations and descriptions of the boats, nets, and other gear in use. In 1883 he took an active part in the International Fisheries Exhibition, and published a memoir on the Sea Fisheries of Great Britain and Ireland. When the Marine Biological Association was founded he served on its Council for some years. [E. A. M.]

List of Holdsworth's Papers in Proc. Zool. Soc. 1855–80.

1. *Scolanthus sphaeroides*, 1855.
2. Two new spp. *Actinia*.
3. *Actinia venosa*.
4. *Electra verticillata*.
5. *Zoanthus Couchii*.
6. *Peachia hastata*.
7. *Actiniæ*.
8. *Aurelia aurita*.

9. *Zoanthus rubricornis*.
10. Leporines. ('Zoologist.')
11. Two new Corals.
12. *Caryophyllia Clavus*.
13. *Felis rubiginosa*.
14. Catalogue of Birds found in Ceylon.
15. Cetacean on West coast of Ceylon.
16. *Xenospongia patelliformis* on coast of Ceylon.
17. Ceylonese Birds. ('Ibis.')
18. Sea-fisheries. ('Nature.')
19. *Astacus* in Spain, 1880.

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|---|------------|
| (1) Handbook to the Fish House in the Gardens of the
Zoological Society of London. | 1860. 8vo. |
| (2) Deep Sea Fishing. | 1874. 8vo. |
| (3) Sea-fisheries. (With A. Young.) | 1877. 8vo. |
| (4) Sea-fisheries of Great Britain and Ireland. | 1883. 8vo. |

Dr. AMBROSIUS ARNOLD WILLEM HUBRECHT was born in Rotterdam on March 2nd, 1853, and died on March 21st, 1915, in Utrecht, in the university of which place he was the distinguished professor of Embryology.

After a markedly successful career at school in Rotterdam and Delft, young Hubrecht took up the study of natural science in Utrecht as a pupil of Professor Harting and Professor Donders. His training in matters zoological was varied and thorough. Thus in 1873-74 he studied at Leiden under Dr. Emil Selenka, and at Naples, where he commenced his work upon the Nemertines which first made his name familiar to zoologists. From this period dated his friendship with Dr. Anton Dohrn and Sir Ray Lankester, whose influence he felt throughout his life's work.

In 1874 he was granted his doctor's degree at Utrecht, the thesis submitted for which was "Aanteekeningen over de anatomie, histologie en ontwikkelingsgeschiedenis van eenige Nemertinen."

He again came under the influence of Professor Emil Selenka, to whom he went as assistant in Erlangen. Returning to Leiden, he became curator of the Rijks Museum voor natuurlijke historie, in which capacity he was brought into correspondence with Gegenbaur, to whom he subsequently went at Heidelberg and attended the lectures of that great master of Vertebrate Comparative Anatomy. It was at this time that Hubrecht wrote his paper "Beitrag zur Kenntniss des Kopfskeletts der Holocephalen."

In 1880 Hubrecht married Miss Marie Molewater, daughter of Dr. G. B. Molewater, of Rotterdam, a lady to whose never-failing interest and sympathy in his work not a little of the professor's success in after-life must be ascribed.

Together with his wife Hubrecht now spent more than a year at Naples following out his earlier work on Nemertines. At the early age of 29 he was elected to the Professorship of Zoology in

the University of Utrecht. The title of his inaugural lecture was "De versnelde ontwikkeling door eerstgeboorte."

In 1885 he was awarded the gold medal presented by the "Utrechtsch Genootschap voor kunsten en wetenschappen" for his work, "Proeve eener ontwikkelings geschiedenis van *Lineus obscurus*." His work upon Nemertines may be said to have culminated in his memoir of the year 1887 on "The Relation of the Nemertea to Vertebrata," the last of a series of half a dozen or so papers on the Nemertines contributed to the 'Quarterly Journal of Microscopical Science.'

Thus was he led to turn his attention and energy to what proved to be the chief interest of his life, the history of the earliest stages in the development of the higher mammals, which he began during the eighties, and he published as a result of this work the first of his "Studies in Mammalian Embryology. I. The Placentation of *Erinaceus europeus*, with Remarks on the Phylogeny of the Placenta," in the 'Quarterly Journal of Microscopical Science,' vol. xxx., 1890.

To his choice of Insectivora and Lemurs as the orders of Eutherian mammals to which he confined his original work, Hubrecht was led by the opinion expressed by Huxley that the Insectivora, especially the Hedgehog, occupy a central and primitive place among mammals, and that the "shrews tend towards the Rodents, the Tupayæ towards the Lemurs." So we find him consistently carrying out his original intention during the succeeding 25 years, and brilliant papers followed one another upon *Sorex*, *Tupaia*, *Tarsius*, *Nycticebus*—and a MS. on *Galeopithecus* remains which was nearly finished at the time of his death.

In 1889 Hubrecht received an invitation from the Royal Physical Society (Koninklijke Natuurkundige Vereeniging) in Batavia to undertake a journey to the Indian Archipelago for the purpose of scientific research, which he "accepted with alacrity" as he expressed it. This resulted in the acquisition of a rich material at the time and in subsequent years; for it was his custom to distribute among native hunters carefully drawn pictures of the animals he required, and thus the supply continued to reach him after his return home. He went also on a similar expedition to Algeria. So recently as the spring of last year, although far from well, he organised and took part in an expedition to South Africa in search of embryological material of rare mammals. He was still there when war broke out and caused his return to Europe.

By means of these expeditions Hubrecht accumulated the invaluable collection of mammalian developmental specimens which is now in the embryological laboratory of the Rijks Universiteit, Utrecht, upon which he continued to work till within a few days of his death.

Hubrecht's desire was to render his own material and that of others available to all who may wish to use it. With this intention he initiated the formation of the Institut international

d'Embryologie. The Institute was founded at Utrecht in 1911; its second meeting was held in Freiburg in 1912, and its third in the early part of last year in Cambridge, just before its founder started on his last embryological expedition. It is earnestly hoped and confidently believed by his friends and family that funds may be forthcoming to make it possible to retain the collection in its present situation (a collection which includes not only all Hubrecht's unrivalled mammalian series, but the valuable collection of Elasmobranch embryo series of the late Dr. Anton Dohrn as well as those of others), which may become the headquarters of the Institute in accordance with the desire of its founder.

No one can read Professor Hubrecht's published papers without becoming aware that the search after phylogeny was the loadstone of his endeavours. The more physiological aspect of embryology—that to which the term developmental mechanics for want of a better has been applied—had little attraction for him. He was a morphologist and delighted in morphological speculation, which, whether we agreed with it or not, was always productive of interest and compelled research. His speculations were apt to be bold and aggressive—to wit, the association of Nemertines and Vertebrates and dissociation of Mammals and Sauropsids. To Hubrecht we owe the term "trophoblast," and the fuller comprehension of the significance and importance of the layer thus designated in the development of mammals and the part it plays in the formation of the placenta; though we are by no means forgetful of the contemporaneous work done in this direction by Matthias Duval and Charles Sedgwick Minot; but Hubrecht had the power to make scintillate what in other hands shone—but shone less seductively.

Hubrecht's many papers on the development of *Erinaceus*, *Sorex*, *Tupaya*, *Tarsius*, were brilliant alike for their discoveries and deductions. His discovery that the placenta and early cœlom formation and character of the allantois in *Tarsius* are unlike what they are in other Lemurs and resemble in some respects the conditions in Primates, led him to wish to transfer this genus from the Lemurs to the Primates. His memoir published in 1909 on the early ontogenetic phenomena in Mammals was essentially an epitome of his life's thought in embryological zoology, and it exhibited a curious combination, a general breadth of vision with a disinclination to meet inconvenient objections. There is one paper, that upon hæmatopoiesis in the placenta, which has not received the attention which probably should rightly be given to it.

A few years ago Hubrecht relinquished the Professorship of Zoology in order to fill the new chair of Embryology founded in Utrecht especially for him. Hubrecht as a Professor had all the qualities which make a successful University teacher—enthusiasm—sympathy—energy—eloquence. He was an accomplished linguist, and drew to himself by his personal charm and intellectual fire a large circle of friends from other countries.

At the present time, when so much has occurred to cause the severance of old ties of friendship between men of different nations, it is pleasant to recall the faith that Hubrecht had in the possibility of a universal brotherhood through science.

Hubrecht was frequently in England—a well-known figure and welcome guest at many scientific meetings, whether of the British Association, the Zoology Congress, or other gatherings of men and women of science. He had received honorary degrees of Doctor of Science from the universities of Cambridge, Dublin, Glasgow, and St. Andrews; also of Giessen, and of Princeton, U.S.A. He was elected Foreign Member of the Linnean Society in 1905. Hubrecht loved controversy; and, in addition to his zoological writings, wrote occasionally on divers subjects, such as “More Daylight Saving” (he was an ardent believer and a practiser of early rising), the “Pro-contra of Middle Europe Time,” “Bacon or Shakespeare?” But those who knew him, at any rate later in years, knew his whole heart was in his mammalian embryology, and to this went his entire energy.

Hubrecht's death has deprived fellow workers in many lands of a friend for whom they had the highest admiration and sincerest affection, and embryological science of the most brilliant and inspiring exponent of our time. [RIC. ASSHETON.]

ARTHUR ROOPE HUNT, M.A. (Cantab.), belonged to an old Devonshire family residing for generations in or near Dartmouth. He himself was born in 1843 at Oporto, where his father was living as a partner in a firm of wine importers. In 1851 his parents left hurriedly in an English man-of-war to escape a threatened revolution.

The family settled in Torquay in 1852, and our late Fellow began his English education under the Rev. Townsend Warner, amongst whose pupils were the present Lord Rayleigh and Field Marshal Lord Grenfell.

A certain delicacy of health prevented any strenuous work towards a profession, but the boy enjoyed his life in open-air pursuits, such as marine physics, zoology and geology.

At the age of eighteen he went up to Trinity College, Cambridge, and after taking his degree in 1864 he studied law and was called to the Bar, but never practised. In 1874 he left London for good, and settled in Torquay, occasionally varying his life by visiting his estate at Foxworthy, Moretonhampstead. His means permitted him to pursue his liking for various lines of investigation, from cave-hunting to yachting, geologizing, and attending meetings of the local Torquay Natural History Society, and in general playing the part of a public-spirited inhabitant. He also belonged to the British Association, the Devonshire Association, the Geological Society, and was elected a Fellow of our own Society, 20th November, 1884. He died at his house in Torquay on the 19th December, 1914, leaving a widow, one son (a barrister), and a married daughter. [B. D. J.]

The Rev. CHARLES HENRY MIDDLETON-WAKE was educated at Christ's College, Cambridge, where he took his B.A. degree in 1852, proceeding to M.A. in 1882. He was ordained deacon in 1851 and priest in 1852, by the Bishop of Lichfield. He was Vicar of Lingen, Herefordshire, from 1870 to 1874; from 1881 to 1885 he held the post of assistant chaplain at the Savoy, and was Sandar's Reader 1896-97. He became a Fellow of the Linnean Society in 1883, but his interests were more artistic than scientific, and he was known as an authority on etchings and engravings. In 1878 he published a 'Descriptive Catalogue of the Etched Works of Rembrandt van Rhyu,' and in 1894 a 'Catalogue of the Engraved Work of Albert Dürer.'

[E. A. M.]

WILLIAM RANSOM came of an unbroken line of Quaker ancestors from Stuart times. He was born in 1826 at Hitchin, and there he died on the 1st December, 1914, at the age of 88. He learned the business of a pharmaceutical chemist with Messrs. Southall, of Birmingham, returning in 1845 to open a pharmacy at Hitchin, and also to start upon the cultivation of aromatic and medicinal plants, with a view to the distillation of essential oils and the manufacture of extracts, such as belladonna and henbane. By 1850 he had become known as a grower of herbs, distiller of lavender and peppermint. He continued the joint occupation of this business with that of chemist until 1866, when he disposed of the latter, which later came into the possession of Mr. Nicholas Henry Martin, F.L.S., now of Newcastle-upon-Tyne. The title of the firm was altered in 1885 to William Ransom & Son, and in 1913 it became a private company.

Our late Fellow was a generous supporter of local schools and similar educational movements. He was a J.P., a Fellow of the Society of Antiquaries, and joined our Society on the 5th March, 1885.

[B. D. J.]

Sir JOHN BENJAMIN STONE, whose death took place at Erdington on the 2nd July, 1914, was best and most widely known as an enthusiastic photographer, an art which he pursued with the view of preserving for posterity faithful records of buildings, customs and ceremonies. He was born in 1838 at Aston near Birmingham, where his father, Benjamin Stone, was a glass manufacturer, and to that business he succeeded, together with interest in a paper mill, under the title of Smith, Stone & Knight. He was educated at King Edward's School, New Street, during the headmastership of Dr. Gifford. The success of his commercial life enabled him to retire at an early age, and to devote himself to municipal and political life (he was M.P. for East Birmingham from 1895 to 1909), and to prosecute his many hobbies. At the time of his death, it was stated that his collection of photographs amounted to more than 25,000, all carefully annotated and arranged. He was elected a Fellow of the Society on the 3rd March, 1887.

[B. D. J.]

WILLIAM JOHN TREUTLER, whose sudden death took place at Hove on 20th March, 1915, was born at Dinapore on 23rd October, 1841. He received his early education in India and in Germany, but returned early to Calcutta to continue his studies in the College of that city. Then he entered the Medical College at Calcutta, and in time became Sir Joseph Fayrer's head dresser. Afterwards he went to Edinburgh University, where he was associated with Sir James Simpson and Lord Lister, and there took his degree of M.D. In 1869 he came to Kew, where he set up a medical practice and served as doctor to the Royal Botanic Gardens until 1874, when he went back to India, returning to England the following year. During the next fifteen years he practised at Fletching, near Uckfield, Sussex. In 1890 he went to Hove, where he died, and was buried on 24th March, 1915. He was a M.B., C.M., and L.M. of the Medical College of Calcutta and the University of Edinburgh, and an M.D. of Edinburgh.

He was from his early days much interested in botany, and made some fine collections in the neighbourhood of Darjeeling, partly in places which had not, or only incompletely, been explored before. He contributed his rarer plants to Kew, not a few turning out to be new to science, among them *Treutlera insignis*, Hook. f., a new genus of Asclepiadaceæ.

His own herbarium of Sikkim plants, about 700 specimens, was acquired for Kew on his death; other sets are at Petrograd and Berlin.

He was a man of broad and liberal education and many interests, and a good musician. He was a Fellow of the Linnean Society from 1868 to his death, and took an active interest in the affairs of the Brighton & Hove Natural History and Philosophical Society, whose president he was for 1898–99. He was also a Vice-President of the South Eastern Union of Scientific Societies.

[O. S.]

AUGUST FRIEDRICH LEOPOLD WEISMANN was born on January 17, 1834, at Frankfort-on-the-Main. His father was Professor of Classical Philology at a "Gymnasium" in that city; his mother, a refined, artistic woman, possessed considerable talent in music and portrait-painting. Their quiet home-life was a united and very happy one. Weismann was the eldest of four children, who were brought up simply and strictly; he always spoke of his parents with great admiration, holding them up to his own children as examples; and he himself retained his simple and unassuming habits to the end of his life.

As a boy, Weismann was a keen collector of insects and plants, and later showed leanings towards Chemistry and Physics, but on practical grounds, it was decided that he should study Medicine. With this object he went, in 1852, to Göttingen, and at the close of his course published his Inaugural Dissertation on a chemico-physiological subject. In 1856–7 he acted as assistant in the clinical hospital, and then as chemical assistant at

Rostock. In 1858, after visiting Vienna, he returned to Frankfurt, and began private practice as a physician, working at histology in his spare time: amongst his contributions to this subject may be mentioned his discovery of the minute structure of the heart-muscles. In 1859 he joined the Medical staff of the Army and went to Italy, then visited Paris, and—for two months only—studied Zoology under Leuckart at Giessen, working at the subject day and night. On returning to Frankfurt, he soon tired of his practice, and in 1861 accepted the position of private physician to the Archduke Stephan of Austria, at Schaumburg Castle on the Lahn. Here he remained two years, spending his leisure time in zoological research. In 1863 he came to Freiburg-im-Breisgau as a Privat-Dozent, and in 1866 was elected *Professor Extraordinarius* in that University, and some years afterwards *Professor Ordinarius*. This chair he held until his retirement in 1912, in spite of calls to other Universities.

In 1867, Weismann married Mary, the eldest daughter of Adolf Gruber of Genoa. The second daughter later became the wife of Robert Wiedersheim, and the eldest living son, August, took up Zoology as a profession: these both still hold Professorships in Freiburg. The various members of the large family regularly assembled during the summer vacation at their father's beautiful estate on the Lake of Constance, where Weismann made his studies on the microscopic fauna of the lake.

Weismann's family consists of four daughters and one son, who was only four years old when his mother died. The death of Weismann's gentle and refined wife was a great blow to him, and he devoted himself more and more to his work and to the care and education of his little son, who, at an early age, showed a marked gift for music. In consequence of this and of the fact that the boy's health needed care, his father decided not to let him continue his ordinary course at the Gymnasium after his 14th year. Julius Weismann is now well in the foreground amongst the younger composers: his music was a constant source of joy to his father. Both Weismann and his wife were extremely musical, and in the earlier days he played the piano a great deal. His memory was wonderful, and he was able to keep up his playing of Bach's works until his 80th year, although his fingers almost refused to do their work and his sight nearly failed him.

In 1864, as a result of overstrain with microscopic and other work, Weismann's eyes began to suffer, and the hyperæmia and great sensitiveness of the retina became more and more serious as time went on, acting as a continual break on his energies, causing him much physical and mental pain, and nearly resulting in the abandonment of his career. This trying period would have been insupportable had it not been for the true companionship and loving care and sympathy of his wife, who encouraged and helped him in everything. In order to try the effect of a long rest he

obtained leave of absence from Freiburg for two years (1869-71) and went with his family to Italy. On his return there was so great an improvement in his sight that he was even able to use the microscope during the following ten years, when the trouble again became more serious and he was obliged to confine his researches to observations which did not cause so great a strain on his eyes and to more theoretical work, leaving much of the actual observation to his assistants and others working under his inspiration and direction. Reading also became a difficulty, and was practically impossible by artificial light, so that he had to employ someone to read to him. He had very wide interests in literature and art, and often enjoyed having a simple German or English novel read out to him.

One of Weismann's chief recreations was his daily walk on the hills and in the woods around Freiburg, of which he never tired. He used to be an energetic walker, but when the eye-trouble became worse, he had to avoid long stretches of open road as well as anything dazzling or glittering. His affliction often prevented him from joining in with others and from going much into society. He was a man of splendid physique, tall and strongly built.

Up to last August, when he was staying at his son's house near Lindau on the lake of Constance, he continued his work on the coloration of butterflies. The sudden outbreak of war affected him greatly: the shock and grief brought on an attack of heart trouble, but he recovered sufficiently to be taken back in September to Freiburg, where he was tended by his eldest daughter. About the middle of October he began to lose strength, and his son, who was at the time engaged at the base-hospital in Lindau, obtained leave to be with his father. He passed peacefully away on November 5th, while his son was playing some of his favourite music.

Many English biologists can recall the attractiveness of Weismann's personality and his kindness to younger men; but perhaps few knew him intimately enough to appreciate fully the nobleness and generosity of his character and his capability of deep affection.

He visited England three times, attending the meeting of the British Association at Manchester in 1887, and going to Oxford in 1894 to deliver the Romanes Lecture and to receive the honorary D.C.L. of that University. In addition to the many honours he received in his own country, he was elected a Foreign Member of the Linnean Society in 1887 and of the Royal Society in 1910, and was awarded the Darwin-Wallace Medal of the former Society and the Darwin Medal of the latter in 1908.

For many years the Zoological Department of Freiburg University was housed in part of the old monastic buildings. In 1886 a new Zoological Institute and Museum were built, the lecture-room of which soon proved to be too small, and some years afterwards was replaced by one capable of seating about

three hundred. As a lecturer, Weismann had exceptional powers: his annual course on the theory of Evolution, which was not confined to students of the University, attracted large audiences.

Apart from Weismann's earlier researches, which included many important contributions to histology and embryology, his life's work was dominated by a central idea—first clearly indicated in his papers on the sexual cells of the Hydrozoa—that of following out his ideas on evolution, based on selection, to their logical outcome. He attempted to build up a theory of heredity which was not to be looked upon as “a structure calculated for eternity, but as one which should serve as a solid nucleus—a crystallization-point—for further research, and around which new acquisitions in knowledge should group themselves for a time” a theory which should be capable of “modification without giving up its fundamental principles.” Thus the theory of the “germ-plasm” was gradually evolved, and eventually led up to that of “germinal selection” and to further arguments against the belief in the transmission of somatic modifications. He rarely entered into controversy, one of the few exceptions being his replies to Herbert Spencer in the ‘Contemporary Review’ in 1894-5.

The preparation of a third edition of the “Vorträge über Descendenztheorie” involved a great amount of work and was a heavy strain upon the author, as much new matter relating to his own theories as well as to important researches which had appeared since the previous edition (*e. g.* those dealing with Mendelism) had to be incorporated. It appeared in 1913, and may be looked upon as a summary of Weismann's life's work.

His seventieth birthday was celebrated in Freiburg by the presentation of a “Festschrift” and of a bust, subscribed to by Biologists from many countries, which has been placed in the Zoological Institute. On this occasion, he gave a short account of his career.

Weismann, on whom, it has been said, Darwin's mantle had fallen, contributed an essay to the Cambridge Volume on “Darwin and Modern Science” in 1909: the following translation of a passage taken from his address at Freiburg in connection with the Darwin Centenary Celebration, is interesting as giving some idea of his views on the ethical bearings of evolution:—

“The human race will never consist of entirely unselfish saints; but I believe that the number of those who act on the basis of a purer and higher humanity and in whom the care for the whole race overshadows that of self, will increase as time goes on, as we know it has done in the past and has led to higher forms of religion and to higher ethical conceptions. The theory of evolution has often been perverted so as to indicate that what is merely animal and brutal must gain the ascendancy. The contrary seems to me to be the case, for in

man it is the spirit, and not the body, which is the deciding factor."

It is impossible, in a few lines, to attempt an account of the far-reaching results of Weismann's work, which has given so great a stimulus to biological research, or to refer in detail to his numerous publications, many of which have been translated into English *.

[W. N. P. & H. P.]

June 3rd, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the Anniversary Meeting of the 29th May, 1915, were read and confirmed.

The President thanked the Society for the Resolution of sympathy with him and his family, which was passed at the Anniversary Meeting. He also announced that he had appointed Mr. HORACE W. MONCKTON, Dr. A. B. RENDLE, Prof. A. C. SEWARD, and Dr. A. E. SHIPLEY, Vice-Presidents for the ensuing year.

A special vote of thanks was passed to Mr. Thomas Henry Riches, F.Z.S., for his gift of 509 volumes from the library of our late Fellow, Dr. Alfred Russel Wallace, O.M.

Dr. John Christopher Willis was admitted a Fellow.

Mr. Tom Willcocks was proposed as a Fellow.

Mr. Chinnakavanam Tadulingam was elected a Fellow.

Prof. E. A. MINCHIN, F.R.S., Sec.L.S., gave a summary of a paper by the Misses KATHERINE FOOT and E. C. STROBELL, which had been communicated by the President, on "The Results of crossing two Hemipterous species, with reference to the inheritance of two exclusively male characters."

The President and Prof. Herdman contributed further remarks, the latter remarking that a discussion of chromosomes and heredity had been arranged for during the British Association Meeting at Manchester in the autumn, when it was to be hoped that the authors of this paper might be present and take part in the discussion.

Mr. HORACE W. MONCKTON, Treas. & V.-P.L.S., then introduced his "Note on the Plant-association at the foot of the Boium Glacier, Norway."

The Boium is one of the larger glaciers which descends from

* Cf. the Obituary Notices in 'Nature' (vol. xciv. 1914, p. 342) by E. B. P[oulton], and in the 'Journal of the Royal Microscopical Society' (1915, p. 8) by J. A. T[homson].

A full list of Weismann's publications up to January 1904, is given in the 'Bericht über die Feier des 70. Geburtstages' (Jena 1904), and a shorter list in the "Akademisches Vademecum" of Freiburg University.

the great Jostedals snow-field. It flows down into a head-valley of the Fjaerlandsfjord, and the foot of the ice is 492 feet above the sea. The latitude is between 61° and 62° , that is a little north of the Shetlands.

At the foot of the ice there is the usual desolate space with fresh moraine, and plants are gradually finding their way onto this ground. In places where the ice has advanced a little, plants may be found growing and flowering close to the glacier itself.

Among the plants thus creeping onto the moraine were noticed a combination of mountain and valley forms: of mountain plants there were:—*Salix herbacea*, Linn., *Saxifraga stellaris*, Linn., and *Phyllodoce cerulea*, Linn.; and of the forms of general distribution which one does not usually associate with glaciers there were *Achemilla alpina*, Linn., *Trientalis europæa*, Linn., *Pyrola minor*, Linn., *Pinguicula vulgaris*, Linn., *Phegopteris Dryopteris*, Linn., *Lotus corniculatus*, Linn., *Sagina procumbens*, Linn., and a species of *Epilobium*.

Dr. Rendle, Mr. James Groves, and Mr. H. N. Dixon took part in the discussion which followed.

Dr. OTTO STAPF, F.R.S., Sec.L.S., then introduced the subject of the Dragon Tree of Tenerife. He showed various illustrations of the celebrated tree at Orotava, and especially a drawing by Don Augustin Monteverde, dating from the earlier months of 1819, before the tree was partially destroyed by a gale on the 21st July, in that year. This drawing is the property of Dr. Perez of Orotava, who had sent it to Kew for comparison with other illustrations. Dr. Stapf discussed the known history of the Dragon Tree of the Canaries and notices of it from early writers, referring *inter alia* to the resinous product known as "Dragon's Blood," formerly used as a pigment and in medicine, but now almost restricted to colouring varnishes.

Dr. Rendle and Mr. Loder put certain questions, and Dr. Otto Stapf replied.

June 17th, 1915.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 3rd June, 1915, were read and confirmed.

Colonel Masters John Godfery, Mr. Arthur Edward Goodman, Miss Lilian Lyle, Miss Harriet May Robinson, and Mr. Frederick George Spring, were elected Fellows.

Miss E. R. SAUNDERS, F.L.S., sent spikes of Foxglove, *Digitalis purpurea*, displaying various degrees of peloric variation, one spike from a plant bred to show peloria combined with heptandry. (See p. 42.)

Dr. G. B. LONGSTAFF, F.L.S., exhibited some Foxglove flowers from his garden at Putney.

In 1913 he had an unusual number of foxgloves and there were many abnormalities amongst them. Mrs. G. B. Longstaff exhibited on June 5th of that year a fine specimen of synanthly, and two specimens with spirally twisted stems on June 19th. [Proc. Linn. Soc. 1912-13, pp. 66, 67.]

In 1914 there was not such a large crop of foxgloves and but two malformations were noticed: two spikes bearing synanthous flowers, one pure white and one spotted. The seeds from these were saved, sown in a box and raised in a frame. The seedlings were planted out in the early spring. About 65 plants resulted, which all flowered this (their first) season, producing about 70 spikes. Of these about 30 bore flowers of the normal red, or of a pale pink colour, the upper flowers tending to white. About 40 spikes bore white flowers, some spotted, others spotless. Two spikes with pink flowers exhibited synanthly, one withered prematurely, the other was white and dark spotted. About 14 other spikes had synanthous flowers, some pure white, some dark-spotted. As the spikes had not all opened and the plants were planted closely, it was difficult to count with certainty.

Prof. DENDY recalled the exhibition on the 16th June, 1910, by Mr. N. C. Macnamara, of foxgloves grown by him at Chorley Wood, Herts, followed by a note on "Mutations in Foxglove Plants," read on the 16th November, 1911 (Proc. 1911-12, pp. 4-6).

Mr. BRUCE F. CUMMINGS gave an exposition of his account of Colonel George Montagu, the naturalist, concerning whom he had obtained information not previously published. The Society's miniature of him was shown, the only portrait known. (Abstract, p. 43.)

The General Secretary added a few remarks on Montagu's connection with the Linnean Society in its early years, and that ten papers by him had been published in our 'Transactions' between 1798 and 1818.

Dr. GEORGE HENDERSON, F.L.S., sent for exhibition two sheets of dried specimens of *Calotropis procera*, which grows in dry ground in West and Central India; it produces a valuable fibre, the latex a sort of rubber, and the pods a cottony substance. The specimens had been furnished by Mr. Arthur Delaval Young-husband, C.S.I., late Commissioner of Sind, and the officers of the Forest Department of Sind. Besides the materials named, a fishing-net was shown, made from the fibre derived from the stem, stated to be one of the strongest known. Dr. Henderson suggested that this species might be profitably grown in the dry northern coast of Africa, and machinery applied to the preparation of the fibre, hitherto effected by hand.

Dr. G. B. Longstaff referred to the wide distribution of this species within the tropics.

Mr. JOHN HOPKINSON, F.L.S., showed two lantern-slides from drawings made by Mr. G. H. Wailes, F.L.S., of British Columbia, displaying the structure of the test of Rhizopoda, with the delicate patterns, and varied forms of strengthening plates, recently observed under a $\frac{1}{12}$ th inch oil-immersion lens.

An animated discussion ensued between Prof. Dendy and Mr. Hopkinson, as to the origin of these strengthening plates.

The four following papers were reports on the material brought home by Prof. J. Stanley Gardiner, F.R.S., F.L.S., from the expedition to the Indian Ocean in H.M.S. 'Sealark' in 1905 :—

Mr. E. T. BROWNE, F.L.S.—Medusæ from the Indian Ocean.

Prof. A. DENDY, F.R.S., F.L.S.—Report on the Hexactinellid Sponges (Trinxonida).

— Continuation (Tetraxonida).

The Author gave an exposition of these two papers, illustrating his remarks by drawings on the black-board.

Mr. J. C. ROBSON, B.A.—On the Cephalopoda obtained. (Communicated by Prof. J. Stanley Gardiner, F.R.S., F.L.S.)

ABSTRACTS.

Brachydactyly as an Illustration of Mendelian Inheritance.

By H. DRINKWATER, M.D., F.L.S.

[Read 4th February, 1915.]

By Brachydactyly is meant a shortening of the fingers to such a degree that it amounts to an abnormality, and interferes more or less with the utility of the hands. I have the pleasure of showing you a selection of slides illustrating this condition, as well as some wax models, and the original photo- and radiographs from which the lantern-slides were made.

The first description of Brachydactyly was given by W. C. Farabee of Harvard, North America, in 1905. He drew attention to the following interesting features :—

- (1) The abnormality, when present at all, affects both hands and both feet.
- (2) The affected individuals are below the average stature.
- (3) They transmit the abnormality to about half their children.

- (4) The normals do not transmit it.
 (5) He traced the defect through five generations. He expressed the opinion that the shortening was due to the absence of one of the bones. The normal finger has three bones; the middle one is missing from the Brachydactylous finger. The toes also are affected in the same way.

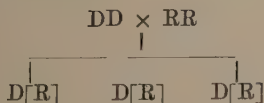
I have been able to make a practically complete investigation of two separate families living in this country, which show the same peculiarities described by Farabee, and I can confirm all his conclusions except that relating to the essential nature of the abnormality. Unfortunately, Mr. Farabee drew his conclusions on this point from insufficient data.

The radiographs which I shall exhibit will speak for themselves, and you will have no difficulty in forming an opinion as to what has happened to produce this interesting abnormality.

In addition to the two families to which reference has been made, I have had the good fortune to meet with two others showing a distinct variation, and presenting a condition intermediate between the normal and the Brachydactylous type. It is in fact a smaller degree of abnormality, and I have therefore termed it Minor-Brachydactyly

Both types afford excellent examples of Mendelian Inheritance, the abnormality acting as a Mendelian Dominant.

An animal or plant which is dominant in the Mendelian sense transmits its peculiarity to its descendants according to the following scheme:—

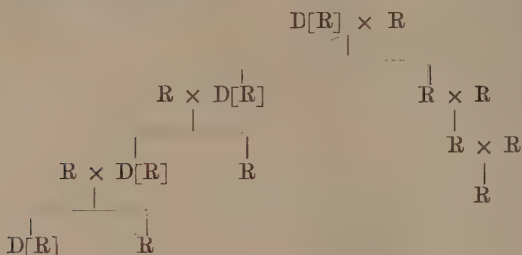


When mated with an individual (RR) which lacks the characteristic feature of the dominant (DD), *all* the resulting offspring resemble the dominant parent *in appearance*, e. g. :—

A pure-bred tall sweet pea, crossed with a dwarf, produces tall plants exclusively. Hence tallness is dominant to dwarfness. The dwarf character disappears and is said to be “recessive.”

Nevertheless the dwarf character is still there in a latent condition, and these individuals may be represented by the letters D[R]. This recessive character of dwarfness, as a matter of fact, becomes manifest in the next generation, for when one of these D[R] tall is crossed with a dwarf (R) the resulting offspring are of both kinds, tall and dwarfs, and not only so, but the two types appear in approximately equal numbers. Pure tall plants (DD) produce tall only, pure dwarfs (RR) produce dwarfs only.

Impure tall, resulting from crossing of the two types, produce tall and dwarfs. Thus :—



Note especially that the Recessives (R) *never* reproduce the Dominant character.

This is exactly what occurs amongst the Brachydactylous people. So far as now traceable each abnormal individual has had *one* abnormal parent, and one normal, for there is no record of two short-fingered people marrying one another.

The short-fingered people may be represented by D[R]—they are dominant—each has married a normal, who is recessive (R), with the result shown in the diagram. A short-fingered parent has children of both types, in about equal numbers. Where both parents are normal, *all* the children are normal also.

These families provide a number of definite *facts* in support of Mendel's *theory*, and that is my reason for bringing the subject to the notice of this Society.

[A list of the 69 slides shown, with detailed explanations of each individual case, was appended.]

Miss SAUNDERS has since supplied the following account of her plants :—

The original heptandrous individual from which my 1915 plants (occupying about half an acre) are descended, appeared in a Cambridge garden in 1906. In 1911 a peloric plant also appeared in Cambridge, and I crossed my heptandrous stock with this individual in order to see whether any interference or inhibition would result when the two characters were combined. I published an account of the inheritance of heptandry in the Jan.-Feb. number of the 'New Phytologist' for 1911 (vol. x. pp. 47-63). That peloria breeds true from seed was well known in pre-Mendelian days (see G. Vrolik, in *Flora*, xxix. 1846, pp. 97-103), and Keeble, Pellew, and Jones found that it behaves as a recessive to the normal (see 'New Phytologist,' 1910, vol. ix. pp. 58-77), but the inter-relations of heptandry and peloria were unknown.

In June 1911 I had a request from Mr. Macnamara (made, I believe, at the suggestion of Professor Dendy) that I should go

and see him in Hertfordshire and explain to him the best method of experimenting with some peculiar Foxgloves which he had, as he wished to know how to carry out experiments on evolutionary lines. This I did, and took him some cut spikes of my flowers. He very kindly gave me some in return, and I used the pollen of one or two flowers in order to compare the result with those of the matings already made with my own plants.

The specimens which I forwarded for exhibition at the meeting on the 17th of June last, were sent as curiosities, possibly unfamiliar to many, and were not intended to illustrate any new point in genetics. Hence I did not attach any importance to their pedigree, and simply cut them at random. They were, in fact, taken from six F_2 descendants of my heptandrous race after it had been crossed with peloric pollen, the pollen being derived in four cases from the Cambridge peloric plant, and in the other two from the Hertfordshire specimens.

COLONEL MONTAGU, Naturalist. By BRUCE F. CUMMINGS.
(Communicated by the General Secretary.)

[Read 17th June, 1915]

Colonel GEORGE MONTAGU (1755–1815) is not a star of great magnitude in the firmament of illustrious dead naturalists. I cannot even claim for him that, like Patrick Mathew, he anticipated Darwin, or that, like Gilbert White, he wrote a book which everybody reads. Yet English field-naturalists have always been ready to give him his due as one of the earliest observers to describe with accuracy and scientific precision the many singular and interesting animals inhabiting our shores and countryside. Professor Edward Forbes wrote of him :—

“Montagu’s eminence as a naturalist depended upon his acute powers of observation and the perspicuous manner in which he regarded the facts which came under his notice. . . . I have had occasion chiefly to test the observation of Montagu in cases where marine animals were concerned and have been astonished at the extent, variety and minuteness of his researches. He laboured at a time when there were few people who took an interest in marine zoology. . . . but Montagu did not shrink from his work because he met few companions or found little sympathy. He steadily pursued his chosen task and laid the foundation of that thorough investigation of the Natural History of the British seas which now forms so distinctive and appropriate a feature of the science of our country.”

The older English naturalists—Yarrell, Rennie, Fleming, Selby, Day—all bear testimony to the value of Montagu's work.

It may be surmised that we are about to deal with a very dull fellow indeed. Certainly it may prove difficult to stimulate general interest in the secluded life of a simple-minded country gentleman who spent his days in catching worms and starfish. Moreover, Montagu's is not a personality requiring subtle psychological analysis. He had no "temperament" and no "mission." He started no movement and was the centre of no new "culture." Neither the Pre-Raphaelites nor the Transcendentalists will be called into account. Let the dead bury the dead. Montagu was "un cœur simple," and those happily unsophisticated few who still can pursue with delight the fortunes of Dr. Primrose and his spouse will not be slow in discovering in the chequered career and naive personality of this warrior-naturalist the same charm and the same idyllic quality which distinguish "The Vicar of Wakefield."

There is no gainsaying Montagu's enthusiasm for zoology. In 1789 he wrote to Gilbert White that were he not bound by conjugal attachment he would have liked to ride his hobby into distant parts. Lady Holland, the famous *grande dame*, records meeting him one day at dinner, when the Colonel "launched forth on the topics he is *au fait* of and during a three hours' assemblage of people at and after dinner, he gave the Natural History of every bird that flies and every fish that swims."

To trace the genesis of his love of Natural History, which in those days must have distinguished him as a very eccentric person, it is necessary to go back to his early youth, when at the age of nineteen he fought in the War of the American Colonies as an officer in the 15th Regiment of Foot. In America he first began to shoot and collect birds, a few of which he prepared with his own hands, though with no further intention than that of presenting them to his Lucasta on returning from the wars.

Montagu had already, at the age of eighteen, married Anne, the eldest daughter of William Courtenay and Lady Jane Courtenay, sister of the Earl of Bute, who was Prime Minister to George III. Montagu himself was a man of some quality, his mother being the granddaughter of Sir Charles Hedges, Queen Anne's Secretary; and his father, James Montagu, being descended from James Montagu, who was the third son of Sir Henry Montagu, first Earl of Manchester.

Montagu's marriage turned out unhappily. Dates and details are not available, but it is perhaps sufficient to say that he became eventually separated from his wife, and in 1799 was living with another lady at Kingsbridge in South Devon, where most of his best work in marine zoology was carried on.

Lady Holland, after remarking upon his reputed ill-temper and the separation from his wife, adds sardonically that he "..."

might inherit an estate from his brother if he would be united to her, but the condition is too hard and he renounces the possession of a benefit so encumbered." His eldest brother James, dying childless, left the family estates at Lackham in Wiltshire to the Colonel's eldest son, the Colonel himself receiving only a rent charge of £800 a year. A lawsuit followed, and father and son were arraigned against each other. The litigation was prolonged, and this, coupled with the son's extravagance, ultimately deprived the family of their estate. Colonel Montagu was forced to endure the mortification of seeing all the fine old timber on the estate cut down and sold, and the valuable library and collection of relics and curiosities at Lackham House sold and disbursed under a decree of the court.

In later years, the loss of his three lusty soldier sons, John, James, and Frederick, brought further sorrow into the old gentleman's life, and in the Parish Church at Lacock may be read the touching memorial he erected to the memory of Frederick, his favourite, who fell pierced through the heart by a musket ball, while leading his men to the charge at the Battle of Albuera in 1811.

In spite of Lady Holland's gossiping references to a threatened court-marshal, there is every reason to believe that Montagu himself was a very gallant soldier who lived up to the best traditions of English honour. His book, 'The Sportsman's Directory,' contains some very curious passages of instruction in the art of fighting a duel.

His house at Kingsbridge was full of curiosities and trophies, and "there were live birds all over the grounds," and ducks, gulls, and all sorts of swimming-birds on the pond. This recalls Walton Hall, the residence of Charles Waterton, the "mad Englishman," famous as a naturalist and as the author of the 'Wanderings in South America.'

Life in the little town in Devonshire must have flowed very quietly. Although of ancient and honourable descent, Montagu founded his claims to respect upon individual merit rather than upon noble ancestry. He disliked pomp and ceremony of all kinds, and found his true measure beating through the brushwood to identify the song of the wood-wren, or digging up worms from the mud in the estuary: a life of seclusion broken occasionally by the "staggering" discovery of some new kind of beast or by the presentation of his memoirs to the Linnean Society. His mistress, Eliza Dornom, seems to have proved herself a valuable helpmate to the naturalist, for many of the drawings of the animals he studied bear her initials.

Montagu died of lockjaw in 1815 after treading on a rusty nail during the course of some repairs to the house, when a lot of old timber was lying about. His authoritative biographer, William Cunningham, in his short memoir in the Wiltshire Magazine, tells us that in his last illness, Montagu bore his sufferings with the

equanimity of a philosopher and the fortitude and resignation of a true Christian. An old friend, the Rev. K. Vaughan, of Modbury, was at his bedside when he died. On being asked where he would like to be buried, the Colonel replied calmly, "Where the tree falls, there let it lie"; which seems to show that he met even the Last Enemy with a stout heart.

Many years ago when Kingsbridge Church was being restored, the vaults in the aisles were opened and the lead stolen from the coffins. Montagu's coffin was the most massive of all, but the thieves succeeded in ripping off the lead, the remains of the coffin and the naturalist's bones being pitched back into the vault.

Montagu's fame as a naturalist rests mainly on his Ornithological Dictionary, which, at the time of its publication in 1802, formed an excellent compendium of information on the structure, life-history, and habits of our British Birds. This curious old book, arranged in alphabetical order, established Montagu's reputation. Even a superficial survey will convince the student of its worth. It was Montagu who first made known to science the beautiful Roseate Tern, which he named *Sterna Dougalli* in honour of Dr. M'Dougall, who sent him specimens from the Cumbræes in the Firth of Clyde. One of these historic specimens is still preserved in the Natural History Museum at South Kensington.

By paying strict attention to the changes of plumage incidental to age, sex and season, Montagu achieved a great deal of useful work, and, among other things, proved that the "Greenwich Sandpiper" was only one of the many varieties of the Ruff; that the "Ashcoloured Sandpiper" is really the Knot. Similarly, he disposed of the "Winter Gull" which was only *Larus canus*, and corrected the mistake of "that celebrated author, Mr. Pennant," concerning the "Brown Owl," which was merely a variety of the Tawny species (*Syrnium aluco*). Montagu gave us the first adequate account of the natural history of the Dartford Warbler, and those who have learnt to recognize and admire the beautiful Cirl Bunting may like to know that Colonel Montagu first discovered the bird in this country. With the characteristic caution and critical discernment of the scientific man, Montagu hesitated to embrace Gilbert White's heresy of the hibernation of swallows, believing the majority to migrate while a few only were detained by accident and, becoming torpid, perished before the return of warmer weather. It is usually stated that Mrs. Blackburn ('Nature,' 1872, vol. v. p. 383) first confirmed Jenner's controverted statements about the cuckoo's ejection of the young of the foster parent. But Montagu's remarks on this subject in the Dictionary in 1802 support and confirm Jenner's remarkable discovery, and there is no reason to disbelieve the Colonel's word that his own observations were actually made before those of Jenner.

We learn from Cunnington that Montagu always kept his word, was always punctual, precise in his methods of work, punctilious over questions of fact, and in industry indefatigable. These jots and tittles of evidence point straight to the conclusion that the Father of English Ornithology was a good type of the average man of science—accurate, conscientious, thick-fingered, laborious, practical, excellent. Perhaps he was also pig-headed, irascible and proud. Anyway, if the reader be tempted to dip into the Ornithological Dictionary—and I heartily recommend the experiment—he will find therein revealed another characteristic which easily falls into line with the rest and completes the picture for us: the Colonel could not spell, and he struggled with the English Syntax like a lion in a net! The critics—oh! serious critics!—taxed the old gentleman with writing “ossious,” “curviture,” “delatable,” and for such formidable English as, “With all these reflections formed on the known laws of Nature, evinced by daily experience, we can have no more doubt of the identity of these two shrikes as distinct species than we have that they are different from the Cinereous Shrike.”

Using the butt end of his pen, he repulsed the attack of his critics by likening them to “assassins with hands continually imbued in blood.” Critics and assassins followed “congenial trades,” for “each stabs in the dark and are too frequently actuated by similar motives.”

Proficient in the use of the gun, pistol, and scalpel, the gallant Colonel probably found the pen fiddling work, and after all, love, marriage, and war at the age of nineteen scarcely form the right psychological climate for acquiring a pure English style.

There is no space to speak fully of Montagu’s interesting discoveries in marine zoology. He discovered several new fishes, and added the beautiful Butterfly Blenny to the British list. In the ‘Testacea Britannica’ 470 molluscs are enumerated, upwards of a hundred of which had not been described before, or else were then for the first time ascertained to be British.

Quite a *tour de force* in its way was his ‘Spongia Britannica,’ for in Montagu’s time it was no easy matter to write a book on British sponges, as next to nothing was known of their structure, and systematic writers therefore had to rely upon inadequate and superficial characters for differentiating species. Montagu himself speaks of it as an “occult science,” and it is very much to his credit that succeeding authors have been unanimous in regarding his sponge work as “good as far as it goes.”

It is natural of course to compare him with his correspondent and more famous contemporary, Gilbert White, the association being more by contrast than similarity. Both were field-naturalists who drew “the hidden treasures from their native sites.” But Montagu was an efficient zoologist who mentally photographed and faithfully recorded phenomena in a series of memoirs to learned Societies. White strolled in his garden or on Selborne

Hanger, and then wrote a letter telling us what he had observed. Moreover, White was a scholar and wrote tolerable verses. There is a delightful personal flavour in his book, and the 'Natural History of Selborne' is as fresh to-day as if the ink were still wet on the page. The hard, impersonal verities, which Montagu recorded with a graceless pen, have long since passed into the body of our general information, and there remains no particular cause, unless it be curiosity, to seek out the archives in which they are entombed, and no bounden duty, unless it be gratitude, to perpetuate the memory of the man to whom, whether naturalists know it or not, they are indebted for a large proportion of our seaside Natural History and the Natural History of our British Birds.

[The portrait of Colonel Montagu, which forms the frontispiece of this part, is from a miniature bequeathed to the Linnean Society by Mr. H. Dorville, as recorded in the General Minutes, 3rd December, 1874.—B. D. J.]

HISTORY AND CONSTITUTION
OF
MEDALS
IN THE GIFT OF THE COUNCIL OF
THE LINNEAN SOCIETY OF LONDON.



THE following account of the Medals subject to the award by the Council, is preceded by a statement of two Medals offered to the Society, but not accepted, for sufficient reasons.

On the 3rd September, 1846, Mr. EDWARD RUDGE, who had been a Fellow from 1802, died, and by Will directed that a sum of £200 should be placed in the hands of the Council, to found a medal to be given each year to the Fellow publishing the best paper in the annual part of the 'Transactions.' This bequest was considered at four Councils, the last approving a circular which was sent to each Fellow, setting out the reasons which caused the Council to decline the bequest; and at the special meeting held on the 8th January, 1847, the action of the Council was fully approved. The full history may be read in our 'Proceedings,' vol. i. pp. 315-317.

The second medal suggested was the generous offer made by Mrs. Cobbold and her son. Dr. C. S. W. Cobbold, to found one in memory of Dr. THOMAS SPENCER COBBOLD, a Fellow from 1857 till his death on the 20th March, 1886. He left his books and certain specimens to the Linnean Society, and ultimately the specimens and accompanying note-books were transferred to the Museum of the Royal College of Surgeons. The proposal was carefully considered by the Council, but on the 18th February, 1887, a decision was arrived at, that in consequence of certain difficulties, the project could not be carried to the conclusion desired by the intending donors.

Although the Cobbold Medal thus never took shape, it was nevertheless a suggestion which ultimately led to the founding of the LINNEAN MEDAL in the following year, when the Society celebrated its century of activity. The account given by the President on the occasion of the first award may be restated here, as explaining the events which led to the foundation of the medal.

"In considering how the Society could specially signalize the celebration of their hundredth Anniversary, the Council resolved to institute a medal, to be known as the Linnean Medal, and to be presented at each Anniversary to one of the most illustrious biologists as an expression of the Society's estimate of his services to science. The following rules were adopted to guide the Council in awarding the medal:—

Extract from Council Minutes, 3rd May, 1888.

'It was resolved that, in connection with the Centenary

of the Society, a Medal, to be called the "Linnean Medal," be founded under the following regulations:—

1. The Medal shall be of gold, and costing not less than £14.
2. The Medal shall have on the obverse the head of Linnæus, modelled from the bust in the Library [by Lauritz Terpager Malling Prior, *b.* 1840, *d.* 1879], and on the reverse the arms of the Society with the name of the recipient.
3. The Medal shall be given in the present year to a Botanist and a Zoologist, and in future years to a Botanist and a Zoologist alternately, commencing with a Botanist.
4. Any Biologist shall be eligible to receive the Medal who is not at the time a Member of the Council.
5. The person to whom the Medal is to be presented shall be selected by the Council.
6. The Medal shall be presented to the person to whom it is awarded, or his representative, by the President at the Anniversary Meeting, and the President, in presenting the same, shall specify the grounds on which the Medal has been awarded.'

"This is not the first occasion on which the question of a Medal has been considered by the Council and Fellows of the Society. Edward Rudge, who was elected a Fellow in 1802, and who for forty-four years thereafter took a warm interest in its welfare, bequeathed to us the sum of £200 to found a Gold Medal to be called 'The Linnean Medal,' to be given to the Fellow who should contribute the best memoir in each volume of the Transactions after his decease. The Council carefully considered the matter, and at a meeting convened for the purpose on the 8th of January, 1847, the Society adopted the recommendation of the Council to decline the bequest, because the terms under which it required to be administered would, in all probability, be injurious to the best interests of the Society.

"Now, with the cordial approval of every one, a medal has been established on terms which it is believed can reflect only honour on the recipient and on the donor. The occasion of the foundation of the medal being the centenary of the Society, it has been resolved that two medals be given, the one to a botanist, the other to a zoologist, representing the two departments of biology, the proper field of the Society's work. It has been a matter of not a little anxiety to the Council that, in selecting the first recipients of the Medal, they should choose men not only worthy in themselves to receive this honour, but men so universally esteemed for their scientific labours that their choice would testify to the world the great importance attached by the

Linnean Society to the award of the Linnean Medal. I have the great satisfaction of announcing that as a botanist the Council have unanimously selected Sir Joseph Dalton Hooker for the one Medal, and as a zoologist, with the same unanimity, Sir Richard Owen for the other Medal." (Proceedings, 1887-88, pp. 80-81.)

A list of the later recipients is to be found in the official 'List' of the Society, following the enumeration of the Associates.

A memorandum drawn up by Prof. J. W. TRAIL, F.R.S., on a proposed Fund for research on Protoplasm, accompanying a gift of £100 for its foundation, was considered in Council 1st April, 1909, and after being reviewed in detail, the following is the constitution of the Trail Award and Medal. Prof. Trail's memorandum is as follows :—

1. The object in view is to encourage study that throws light upon the substance known to us as Protoplasm, or on what may in the progress of knowledge be regarded in a corresponding way as the physical basis of life. To me it appears that a wide interpretation should be given to the scope of such a study, and that under it should be included direct experimental research into the properties and responses of Protoplasm, healthy or pathological, including galls, and also the indirect evidence afforded by many branches of the biological sciences, including classification, and certain branches of the study of mankind. The interpretation or decision of the studies most helpful at any period must be left to the governing body at the time.
2. The method of encouraging such research that has occurred to me as perhaps the best at present is by the award, at intervals of five or ten years, of a medal, or other recognition of noteworthy researches carried out or published during the interval since the previous award; but with power to make no award if there have been no researches carried out that appear worthy of recognition. Awards should not be limited by nationality or in any other way than by merit.
3. The decision as to giving awards or withholding them, on the merits, must rest with the awarding body, whose decision must be final. There should be no feeling that it is necessary to make an award if there is doubt as to the merit of the researches under consideration for any of the periods.
4. If an award should not be made the question might arise whether the sum then available should be added to the

capital, or held in hand for one term for a second grant at the next period, should there be two awards desirable on their merits; but I think that, if not then awarded, the revenue should be added to the capital when not required within the interval after the period to which it rightly belonged.

5. Provision should be made for the alteration of the regulations in case the object sought were provided for more adequately in some other way, or in case it appeared undesirable to continue such awards, or that the fund could be applied more beneficially toward the promotion of the study of biological science in some other way.

(signed) JAMES W. H. TRAIL.

The Council, on the 6th May, 1909, after adopting the above, further added these regulations:—

That the fund be used to provide a Bronze Medal, and that the balance of the income from the fund be presented to the recipient of the medal.

That the Linnean Medal obverse be used for the [Trail] Medal; that a simple reverse be prepared at a cost of £3 (three pounds) to be advanced by the Society and repaid from the income of the fund.

That the cost of striking the Medal be charged to the fund.

That, if desirable, the first award may be made out of capital and the amount repaid to the fund from income.

On the 20th January, 1910, the Council further added:—
“... a letter from Prof. Trail to the President (offering to provide the cost of the first award) was read, whereupon three copies of the Medal were ordered to be struck; one each for Prof. Trail and the Society, and the other for award upon nomination of the recipient by the Council.”

The CRISP AWARD came before the Council held on the 7th April, 1910, when Sir Frank Crisp's “offer to provide the capital sum of £200 for an award for microscopical research ... was gratefully accepted.

“It was agreed that the first award be made two years hence, that it may be withheld for good cause, and that it be restricted to Fellows.

“The details were referred to a Committee of the Officers, the donor agreeing to draw up the constitution of the gift.”

On the 5th May, 1910, the constitution of the Award and Medal was decided, as follows :—

1. The Award is to be made at intervals of not less than five years.
2. The Award to be given by the Council for the best paper dealing with microscopical research.
3. The Award to be confined to Fellows, and to work published by the Linnean Society, since the previous award, and in the first case, during the five years previous.
4. The first Award shall be given in May 1912.
5. The Award to be paid out of the accrued interest on the £200, and to be accompanied by a bronze medal, similar to the Trail Medal, but bearing the words :
“ Crisp Award for Microscopical Research.”
6. The Fund to be invested in Metropolitan Water Board “ B ” Stock.
7. With regard to the procedure in the event of the Award being withheld, the provisions of the Trail Award to be followed.

The first award was made on 24th May, 1912, the amount being made up to £30 by Sir Frank Crisp, Bt., as recorded in the Council Minutes for the 18th April of that year.

ADDITIONS AND DONATIONS

TO THE

LIBRARY.

1914-1915.

Ann Arbor.

University of Michigan.

Occasional Papers of the Museum of Zoology. No. 1→

8vo. *Ann Arbor*, 1913→. **Director.**

Arnold Arboretum. Publications. No. 6.

4to. *Cambridge, Mass.*, 1914.

No. 6. **TUCKER, E. M.** Catalogue of the Library, Vol. I. **Director.**

Australian Zoologist (The). See *Sydney, Royal Zoological Society of New South Wales.*

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Proceedings. Vol. I. No. 1→

8vo. *Baltimore*, 1915→

Bean (William Jackson). Trees and Shrubs Hardy in the British Isles. 2 vols.

8vo. *London*, 1914.

Bequaert (J.). See *Katanga*. Rapport sur les Travaux de la Mission Scientifique (Octobre 1910 à Septembre 1912).

8vo. 1913.

Blanford (William Thomas). The Fauna of British India, including Ceylon and Burma.

8vo. *London*, 1888-1914.

Mollusca.—II. (Trochomorphidæ—Janellidæ). By G. K. GÜDE.

Börjesen (Frederik C. E.). The Marine Algæ of the Danish West Indies. Part 2. Phæophyceæ. (Dansk Bot. Ark. Bd. 2, no. 2.)

8vo. *Copenhagen*, 1914. **Author.**

Boldingh (I.). Flora voor de Nederlandsch West-Indische Eilanden.

8vo. *Amsterdam*, 1913.

Koloniaal Instituut, Amsterdam.

— The Flora of the Dutch West Indian Islands. 2 vols.

8vo. *Leiden*, 1909-14.

Vol. I. The Flora of St. Eustatius, Saba, and St. Martin.

„ II. The Flora of Curaçoa, Aruba, and Bonaire.

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Branden (F. Vanden). See *Katanga*. Rapport sur les Travaux de la Mission Scientifique (Octobre 1910 à Septembre 1912).

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British Antarctic ('Terra Nova') Expedition, 1910. See **British Museum (Natural History).**

British Association for the Advancement of Science.

Handbook for New South Wales.

8vo. *Sydney*, 1914.

N.S.W. Committee.

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British Antarctic ('Terra Nova') Expedition, 1910. Natural History Reports. 4to. *London*, 1914.

Geology. Vol. I. No. 1. Antarctic Fossil Plants. By A. C. SEWARD.

Zoology. Vol. I. No. 1. Fishes. By C. TATE REGAN.

„ Vol. II. No. 1. List of Collecting Stations. By S. F. HARMER and D. G. LILLIE.

MAMMALS.

Catalogue of the Ungulate Mammals in the British Museum (Natural History).

Vol. III. Artiodactyla, Families Bovidæ, Subfamilies *Æpycerotinae* to *Tragelaphinae* (Pala, Saiga, Gazelles, Oryx group, Bushbucks, Kudus, Elands, etc.), *Antilocapridæ* (Prongbuck), and *Giraffidæ* (Giraffes and Okapi). By R. LYDEKKER, assisted by GILBERT BLAINE.

8vo. *London*, 1914.

PLANTS.

Flora of Jamaica, containing Descriptions of the Flowering Plants known from the Island. By WILLIAM FAWCETT and ALFRED BARTON RENDLE. Vol. III. *Dicotyledons*. Families *Piperacæ* to *Connaracæ*. 8vo. *London*, 1914.

Brun (Rudolf). Die Raumorientierung der Ameisen und das Orientierungsproblem im allgemeinen. Eine kritisch-experimentelle Studie; zugleich ein Beitrag zur Theorie der Mneme.

8vo. *Jena*, 1914. Tagart Bequest.

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Washington.

Carnegie Institution.

Publication No. 4.

4to. Washington, 1905.

4. The Waterlilies. A Monograph of the Genus *Nymphæa*. By H. S.
CONARD.

Wedderburn (Sir William). ALLAN OCTAVIAN HUME, C.B.,
"Father of the Indian National Congress" 1829 to 1912.

8vo. London, 1913.

Wollaston (Alexander Frederick Richmond). Pygmies and
Papuan. The Stone Age to-day in Dutch New Guinea.
With Appendices by W. R. OGILVIE-GRANT, A. C. HADDON,
and S. H. RAY. 8vo. London, 1912.

Wood (Alphonso). Flora atlantica. Descriptive Botany; being
a succinct analytical flora, including all the plants growing in
the United States from the Atlantic coast to the Mississippi
River. (From the 'American Botanist and Florist.')

8vo. New York, &c., 1879.

Woodford (Charles Morris). A Naturalist among the Head
Hunters: being an Account of Three Visits to the Solomon
Islands in the years 1886, 1887, and 1888. 8vo. London, 1890.

BENEFACTIONS.

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Portrait of Carl von Linné, ascribed to M. Hallman.

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1906.

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1907.

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The same : First Donation towards the sixth volume, £190.

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